GENERAL DYNAMICS/CONVAIR

October 22, 1963

INSTRUCTION COVER SHEET

TO: All Holders of
MAINTENANCE MANUAL
Model 30

AMERICAN	CS-61-057
SWISS	CS-61-050
VARIG	CS-61-060
GARUDA	CS-63-026
	CS-61-063

SUBJECT: REVISED PAGES - CHAPTER 52
Revision No. 3, dated Nov. 5/63

25

The attached pages provide replacement, revised or new pages to your present chapter.

The List of Effective Pages reflects current pages this chapter should contain.

BRIEF DESCRIPTION OF CHANGES:

1. Revised entrance and service door snubber rod end securing procedure.

2. Expanded references to Chapter 51 regarding chafe preventive coatings on entrance and service door tracks.

3. Revised entrance and service door handle removal and installation procedures to cover handles modified by Service Bulletin 52-6.

LIST OF EFFECTIVE PAGES

Chapter 52
DOORS

CHAPTER	PAGE	DATE	CODE
*52	i	Nov. 5/63	AB-4
*52	ii	Nov. 5/63	AB-4
*52	iii	Nov. 5/63	AB-4
*52	iv	Nov. 5/63	AB-4
52	1	Nov. 1/62	AB-2
52	2	Nov. 1/62	AB-2
52	3	Nov. 1/62	AB-3
52	4	Nov. 1/62	AB-3
52	5	Dec. 20/61	AB-2
52	6	Aug. 30/61	AB-1
52-0	1	Aug. 30/61	AB-1
52-0	2	Aug. 30/61	AB-1
52-0	3	Aug. 30/61	AB-1
	BLANK		
52-0	201	Aug. 30/61	AB-1
52-0	202	Aug. 30/61	AB-1
52-0	203	Aug. 30/61	AB-1
52-0	204	Aug. 30/61	AB-1
52-0	205	Aug. 30/61	AB-1
52-0	206	Aug. 30/61	AB-1
52-0	207	Aug. 30/61	AB-1
52-0	208	Aug. 30/61	AB-1
52-0	209	Aug. 30/61	AB-1
52-0	210	Aug. 30/61	AB-1
52-1-0	1	Aug. 30/61	AB-1
52-1-0	2	Aug. 30/61	AB-1
52-1-0	3	Aug. 30/61	AB-1
52-1-0	4	Aug. 30/61	AB-1
52-1-0	401	Nov. 1/62	AB-2
52-1-0	402	Nov. 1/62	AB-2
52-1-0	403	Nov. 1/62	AB-2
52-1-0	404	Nov. 1/62	AB-2
52-1-0	405	Nov. 1/62	AB-2
52-1-0	406	Nov. 1/62	AB-2
52-1-0	407	Nov. 1/62	AB-2
52-1-0	408	Nov. 1/62	AB-2
52-1-0	409	Nov. 1/62	AB-2
52-1-0	410	Nov. 1/62	AB-2
*52-1-0	411	Nov. 5/63	AB-3
52-1-0	412	Nov. 1/62	AB-2
52-1-0	413	Nov. 1/62	AB-2
52-1-0	414	Nov. 1/62	AB-2
52-1-0	415	Nov. 1/62	AB-1
*52-1-0	416	Nov. 5/63	AB-2
*52-1-0	417	Nov. 5/63	AB-2
*52-1-0	418	Nov. 5/63	AB-2
*52-1-0	419	Nov. 5/63	AB-2
	BLANK		
52-1-0	501	Nov. 1/62	AB-1
52-1-0	502	Nov. 1/62	AB-1
52-1-0	801	Nov. 1/62	AB-2
52-1-0	802	Aug. 30/61	AB-1
52-1-0	803	Nov. 1/62	AB-1
52-1-0	804	Nov. 1/62	AB-1
52-1-1	1	Aug. 30/61	AB-1
52-1-1	2	Aug. 30/61	AB-1
52-1-1	3	Aug. 30/61	AB-1
52-1-1	4	Aug. 30/61	AB-1
52-1-1	5	Aug. 30/61	AB-1
52-1-1	6	Aug. 30/61	AB-1
52-1-1	101	Nov. 1/62	AB-2
52-1-1	102	Nov. 1/62	AB-2
52-1-1	103	Nov. 1/62	AB-1
	BLANK		
*52-1-1	401	Nov. 5/63	AB-3
52-1-1	402	Nov. 1/62	AB-2
52-1-1	403	Nov. 1/62	AB-2
52-1-1	404	Nov. 1/62	AB-2
52-1-1	405	Nov. 1/62	AB-2
52-1-1	406	Nov. 1/62	AB-2
52-1-1	407	Nov. 1/62	AB-2
52-1-1	408	Nov. 1/62	AB-2
52-1-1	409	Nov. 1/62	AB-2
52-1-1	410	Nov. 1/62	AB-2
52-1-1	501	Nov. 1/62	AB-2
52-1-1	502	Aug. 30/61	AB-1
52-1-1	503	Nov. 1/62	AB-2
52-1-1	504	Aug. 30/61	AB-1
52-1-1	505	Nov. 1/62	AB-2
52-1-1	506	Nov. 1/62	AB-2

*Pages revised, added or deleted by this revision.

LIST OF EFFECTIVE PAGES (CONT)

CHAPTER	PAGE	DATE	CODE
52-1-1	507	Nov. 1/62	AB-2
52-1-1	508	Nov. 1/62	AB-2
52-1-1	509	Nov. 1/62	AB-2
52-1-1	510	Nov. 1/62	AB-1
52-1-1	511	Nov. 1/62	AB-1
	BLANK		
52-1-1	601	Nov. 1/62	AB-2
52-1-1	602	Nov. 1/62	AB-2
52-1-1	603	Nov. 1/62	AB-2
	BLANK		
52-1-2	1	Aug. 30/61	AB-1
52-1-2	2	Aug. 30/61	AB-1
52-1-2	3	Aug. 30/61	AB-1
52-1-2	4	Aug. 30/61	AB-1
52-1-2	5	Aug. 30/61	AB-1
52-1-2	6	Aug. 30/61	AB-1
52-1-2	101	Nov. 1/62	AB-2
52-1-2	102	Nov. 1/62	AB-2
52-1-2	103	Nov. 1/62	AB-1
	BLANK		
52-1-2	401	Aug. 30/61	AB-1
52-1-2	402	Aug. 30/61	AB-1
*52-1-2	403	Nov. 5/63	AB-2
52-1-2	404	Nov. 1/62	AB-2
52-1-2	405	Nov. 1/62	AB-2
52-1-2	406	Nov. 1/62	AB-2
52-1-2	407	Nov. 1/62	AB-2
52-1-2	408	Nov. 1/62	AB-2
52-1-2	409	Nov. 1/62	AB-2
52-1-2	410	Nov. 1/62	AB-2
52-1-2	501	Nov. 1/62	AB-2
52-1-2	502	Aug. 30/61	AB-1
52-1-2	503	Nov. 1/62	AB-2
52-1-2	504	Aug. 30/61	AB-1
52-1-2	505	Nov. 1/62	AB-2
52-1-2	506	Nov. 1/62	AB-2
52-1-2	507	Nov. 1/62	AB-2
52-1-2	508	Nov. 1/62	AB-2
52-1-2	509	Nov. 1/62	AB-2
52-1-2	510	Nov. 1/62	AB-1
52-1-2	511	Nov. 1/62	AB-1
	BLANK		
52-1-2	601	Nov. 1/62	AB-2
52-1-2	602	Nov. 1/62	AB-2
52-1-2	603	Nov. 1/62	AB-1
	BLANK		
52-1-3	1	Aug. 30/61	AB-1
52-1-3	2	Aug. 30/61	AB-1
52-1-3	3	Aug. 30/61	AB-1
52-1-3	4	Aug. 30/61	AB-1
52-1-3	5	Aug. 30/61	AB-1
52-1-3	6	Aug. 30/61	AB-1
52-1-3	101	Nov. 1/62	AB-2
52-1-3	102	Nov. 1/62	AB-1
52-1-3	103	Nov. 1/62	AB-1
	BLANK		
*52-1-3	401	Nov. 5/63	AB-2
52-1-3	402	Aug. 30/61	AB-1
52-1-3	403	Nov. 1/62	AB-2
52-1-3	404	Nov. 1/62	AB-2
52-1-3	405	Nov. 1/62	AB-2
52-1-3	406	Nov. 1/62	AB-2
52-1-3	407	Nov. 1/62	AB-2
52-1-3	408	Nov. 1/62	AB-3
52-1-3	409	Nov. 1/62	AB-2
52-1-3	410	Nov. 1/62	AB-2
52-1-3	411	Nov. 1/62	AB-2
	BLANK		
52-1-3	501	Nov. 1/62	AB-2
52-1-3	502	Aug. 30/61	AB-1
52-1-3	503	Nov. 1/62	AB-2
52-1-3	504	Aug. 30/61	AB-1
52-1-3	505	Nov. 1/62	AB-2
52-1-3	506	Nov. 1/62	AB-2
52-1-3	507	Nov. 1/62	AB-2
52-1-3	508	Nov. 1/62	AB-2
52-1-3	509	Nov. 1/62	AB-2
52-1-3	510	Nov. 1/62	AB-1
52-1-3	511	Nov. 1/62	AB-1
	BLANK		
52-1-3	601	Nov. 1/62	AB-2

*Pages revised, added or deleted by this revision.

LIST OF EFFECTIVE PAGES (CONT)

CHAPTER	PAGE	DATE	CODE
52-1-3	602	Nov. 1/62	AB-2
52-1-3	603	Nov. 1/62	AB-1
	BLANK		
52-1-4	1	Aug. 30/61	AB-1
52-1-4	2	Nov. 1/62	AB-2
52-1-4	3	Aug. 30/61	AB-1
52-1-4	4	Aug. 30/61	AB-1
52-1-4	5	Aug. 30/61	AB-1
52-1-4	6	Aug. 30/61	AB-1
52-1-4	101	Nov. 1/62	AB-2
52-1-4	102	Nov. 1/62	AB-1
52-1-4	103	Nov. 1/62	AB-1
	BLANK		
*52-1-4	401	Nov. 5/63	AB-2
52-1-4	402	Aug. 30/61	AB-1
52-1-4	403	Nov. 1/62	AB-2
52-1-4	404	Nov. 1/62	AB-2
52-1-4	405	Nov. 1/62	AB-2
52-1-4	406	Nov. 1/62	AB-2
52-1-4	407	Nov. 1/62	AB-2
52-1-4	408	Nov. 1/62	AB-2
52-1-4	409	Nov. 1/62	AB-2
52-1-4	410	Nov. 1/62	AB-2
52-1-4	411	Nov. 1/62	AB-2
	BLANK		
52-1-4	501	Nov. 1/62	AB-2
52-1-4	502	Nov. 1/62	AB-2
52-1-4	503	Nov. 1/62	AB-2
52-1-4	504	Aug. 30/61	AB-1
52-1-4	505	Nov. 1/62	AB-2
52-1-4	506	Nov. 1/62	AB-2
52-1-4	507	Nov. 1/62	AB-2
52-1-4	508	Nov. 1/62	AB-2
52-1-4	509	Nov. 1/62	AB-2
52-1-4	510	Nov. 1/62	AB-1
52-1-4	511	Nov. 1/62	AB-1
	BLANK		
52-1-4	601	Nov. 1/62	AB-2
52-1-4	602	Nov. 1/62	AB-2
52-1-4	603	Nov. 1/62	AB-1
	BLANK		
52-1-5	1	Aug. 30/61	AB-1
52-1-5	2	Aug. 30/61	AB-1
52-1-5	3	Aug. 30/61	AB-1
	BLANK		
52-1-5	101	Aug. 30/61	AB-1
	BLANK		
52-1-5	401	Aug. 30/61	AB-1
52-1-5	402	Aug. 30/61	AB-1
52-1-5	403	Dec. 20/61	AB-2
52-1-5	404	Aug. 30/61	AB-1
52-1-5	405	Aug. 30/61	AB-1
	BLANK		
52-1-5	501	Aug. 30/61	AB-1
52-1-5	502	Aug. 30/61	AB-1
52-1-5	503	Nov. 1/62	AB-2
52-1-5	504	Aug. 30/61	AB-1
52-2-0	1	Aug. 30/61	AB-1
52-2-0	2	Aug. 30/61	AB-1
52-2-0	3	Aug. 30/61	AB-1
52-2-0	4	Aug. 30/61	AB-1
52-2-0	401	Dec. 20/61	AB-1
52-2-0	402	Dec. 20/61	AB-1
52-2-0	403	Dec. 20/61	AB-1
52-2-0	404	Dec. 20/61	AB-1
52-2-0	405	Dec. 20/61	AB-1
52-2-0	406	Dec. 20/61	AB-1
52-2-0	407	Dec. 20/61	AB-1
52-2-0	408	Dec. 20/61	AB-1
52-2-0	409	Dec. 20/61	AB-1
52-2-0	410	Dec. 20/61	AB-1
52-2-0	411	Dec. 20/61	AB-1
52-2-0	412	Dec. 20/61	AB-1
52-2-0	413	Dec. 20/61	AB-1
	BLANK		
52-2-0	415	Dec. 20/61	AB-1
	BLANK		
52-2-0	501	Nov. 1/62	AB-2
52-2-0	502	Aug. 30/61	AB-1
52-2-0	503	Nov. 1/62	AB-1
	BLANK		
52-2-0	601	Aug. 30/61	AB-1
	BLANK		
52-2-0	801	Dec. 20/61	AB-1
52-2-0	802	Dec. 20/61	AB-1
52-2-0	803	Dec. 20/61	AB-1
	BLANK		

*Pages revised, added or deleted by this revision.

LIST OF EFFECTIVE PAGES (CONT)

CHAPTER	PAGE	DATE	CODE
52-3-0	1	Aug. 30/61	AB-1
52-3-0	2	Aug. 30/61	AB-1
52-3-0	3	Aug. 30/61	AB-1
	BLANK		
52-3-0	201	Aug. 30/61	AB-1
52-3-0	202	Aug. 30/61	AB-1
52-4-0	1	Aug. 30/61	AB-1
	BLANK		
52-4-0	201	Nov. 1/62	AB-1
52-4-0	202	Nov. 1/62	AB-1
52-4-1	1	Aug. 30/61	AB-1
52-4-1	2	Aug. 30/61	AB-1
52-4-1	401	Nov. 1/62	AB-2
52-4-1	402	Dec. 20/61	AB-2
52-4-1	501	Aug. 30/61	AB-1
52-4-1	502	Aug. 30/61	AB-1
52-4-1	601	Nov. 1/62	AB-2
	BLANK		
*52-4-2	1	Nov. 5/63	AB-2
*52-4-2	2	Nov. 5/63	AB-2
52-4-2	401	Aug. 30/61	AB-1
*52-4-2	402	Nov. 5/63	AB-3
52-4-2	501	Nov. 1/62	AB-2
*52-4-2	502	Nov. 5/63	AB-2
52-4-2	601	Nov. 1/62	AB-2
	BLANK		
52-4-3	1	Aug. 30/61	AB-1
52-4-3	2	Aug. 30/61	AB-1
52-4-3	3	Aug. 30/61	AB-1
	BLANK		
52-4-3	401	Aug. 30/61	AB-1
52-4-3	402	Dec. 20/61	AB-2
52-4-3	501	Nov. 1/62	AB-2
52-4-3	502	Aug. 30/61	AB-1
52-4-3	601	Nov. 1/62	AB-2
	BLANK		
52-4-4	1	Aug. 30/61	AB-1
52-4-4	2	Aug. 30/61	AB-1
52-4-4	401	Nov. 1/62	AB-2
52-4-4	402	Aug. 30/61	AB-1
52-4-4	403	Dec. 20/61	AB-2
52-4-4	404	Aug. 30/61	AB-1
52-4-4	601	Aug. 30/61	AB-1
	BLANK		
52-4-5	1	Aug. 30/61	AB-1
52-4-5	2	Aug. 30/61	AB-1
52-4-6	1	Aug. 30/61	AB-1
52-4-6	2	Aug. 30/61	AB-1
52-4-6	201	Dec. 20/61	AB-1
52-4-6	202	Dec. 20/61	AB-1
52-4-6	203	Dec. 20/61	AB-1
52-4-6	204	Dec. 20/61	AB-1
52-4-6	205	Dec. 20/61	AB-1
52-4-6	206	Dec. 20/61	AB-1
52-4-6	207	Dec. 20/61	AB-1
52-4-6	208	Nov. 1/62	AB-2
52-4-7	1	Aug. 30/61	AB-1
52-4-7	2	Aug. 30/61	AB-1
52-4-7	201	Nov. 1/62	AB-2
52-4-7	202	Dec. 20/61	AB-2
52-4-7	203	Nov. 1/62	AB-2
	BLANK		
52-5-0	1	Aug. 30/61	AB-1
52-5-0	2	Aug. 30/61	AB-1
52-5-1	1	Aug. 30/61	AB-1
	BLANK		
52-5-1	201	Aug. 30/61	AB-1
52-5-1	202	Aug. 30/61	AB-1
52-5-2	1	Aug. 30/61	AB-1
	BLANK		
52-5-2	201	Aug. 30/61	AB-1
52-5-2	202	Dec. 20/61	AB-2
52-5-3	1	Aug. 30/61	AB-1
	BLANK		
52-5-3	201	Aug. 30/61	AB-1
52-5-3	202	Dec. 20/61	AB-2
52-6-0	1	Aug. 30/61	AB-1
52-6-0	2	Aug. 30/61	AB-1
52-6-0	101	Aug. 30/61	AB-1
52-6-0	102	Aug. 30/61	AB-1
52-6-0	201	Aug. 30/61	AB-1
52-6-0	202	Nov. 1/62	AB-2
52-6-0	203	Aug. 30/61	AB-1
52-6-0	204	Aug. 30/61	AB-1
52-6-0	205	Aug. 30/61	AB-1
52-6-0	206	Aug. 30/61	AB-1

*Pages revised, added or deleted by this revision.

CONVAIR MODEL 30

MAINTENANCE MANUAL

Chapter 52
DOORS

TABLE OF CONTENTS

CHAPTER SECTION	SUBJECT	PAGE
52-0	DOORS	
	General	1
	Removal/Installation - Pressure Seals	201
	Adjustment of Molded Bulb Type Wire - Reinforced Pressure Seals	206
	Approved Repair - Pressure Seal	208
52-1-0	CABIN EXTERIOR DOORS	
	General	1
	Removal/Installation - Main Entrance and Service Door Quadrant	401
	Removal/Installation - Forward Main Entrance Door Interlock Mechanism	405
	Removal/Installation - Rear Main Entrance and Service Door Interlock Mechanism	406
	Removal/Installation - Main Entrance and Service Door Snubber	408
	Removal/Installation - Main Entrance and Service Door Hold-Open Mechanism	411
	Removal/Installation - Main Entrance and Service Door Control Cable	413
	Removal/Installation - Main Entrance and Service Door Control Cable Pulley	414
	Removal/Installation - Main Entrance and Service Door Interior and Exterior Handles	416
	Adjustment/Test - Main Entrance and Service Door Snubber	501
	Adjustment/Test - Main Entrance and Service Door Interlock Actuating Pin	501
	Approved Repair - Fabrication and Installation of Interlock Pin Bushing Retainer Clip	801
	Replacement Procedure - Interlock Pin Ring Bushing	801
52-1-1	FORWARD MAIN ENTRANCE DOOR	
	General	1
	Structure	1
	Door Operating Mechanism	4
	Seal	6
	Drainage Provisions	6

TABLE OF CONTENTS (CONT)

CHAPTER SECTION	SUBJECT	PAGE
52-1-1	FORWARD MAIN ENTRANCE DOOR (CONT)	
	Forward Main Entrance Door - Trouble Shooting.....	101
	Removal/Installation - Forward Main Entrance Door Assembly.....	401
	Removal/Installation - Forward Main Entrance Door Hinge..	403
	Removal/Installation - Forward Main Entrance Door Pin Receptacle Drain Cup.....	409
	Adjustment/Test - Forward Main Entrance Door.....	501
	Inspection/Check - Forward Main Entrance Door Assembly...	601
52-1-2	REAR MAIN ENTRANCE DOOR	
	General.....	1
	Structure.....	1
	Door Operating Mechanism.....	4
	Seal.....	6
	Drainage Provisions.....	6
	Rear Main Entrance Door - Trouble Shooting.....	101
	Removal/Installation - Rear Main Entrance Door.....	401
	Removal/Installation - Rear Main Entrance Door Hinge.....	404
	Removal/Installation - Rear Main Entrance Door Pin Receptacle Drain Cup.....	409
	Adjustment/Test - Rear Main Entrance Door.....	501
	Inspection/Check - Rear Main Entrance Door Assembly.....	601
52-1-3	FORWARD SERVICE DOOR	
	General.....	1
	Structure.....	1
	Door Operating Mechanism.....	1
	Seal.....	6
	Drainage Provisions.....	6
	Forward Service Door - Trouble Shooting.....	101
	Removal/Installation - Forward Service Door.....	401
	Removal/Installation - Forward Service Door Hinge.....	403
	Removal/Installation - Forward Service Door Pin Receptacle Drain Adapter.....	410

TABLE OF CONTENTS (CONT)

CHAPTER SECTION	SUBJECT	PAGE
52-1-3	FORWARD SERVICE DOOR (CONT)	
	Adjustment/Test - Forward Service Door	501
	Inspection/Check - Forward Service Door Assembly	601
52-1-4	REAR SERVICE DOOR	
	General	1
	Structure	1
	Door Operating Mechanism	1
	Seal	1
	Drainage Provisions	5
		6
	Rear Service Door - Trouble Shooting	101
	Removal/Installation - Rear Service Door	401
	Removal/Installation - Rear Service Door Hinge	404
	Removal/Installation - Rear Service Door Pin Receptacle Drain Adapter Cup	409
	Adjustment/Test - Rear Service Door	501
	Inspection/Check - Rear Service Door Assembly	601
52-1-5	EMERGENCY EXITS	
	General	1
	Structure	1
	Latching Mechanism	1
	Seal	3
	Emergency Exits - Trouble Shooting	101
	Removal/Installation - Emergency Exit Door	401
	Removal/Installation - Emergency Exit Door Seal	401
	Adjustment/Test - Emergency Exit Door	501
52-2-0	CARGO COMPARTMENT DOORS	
	General	1
	Structure	1
	Latching Mechanism	1
	Seal	4
	Removal/Installation - Sliding Type Cargo Door	401
	Removal/Installation - Cargo Door Pressure Seal	407
	Removal/Installation - Cargo Door Interior Handle	407

TABLE OF CONTENTS (CONT)

CHAPTER SECTION	SUBJECT	PAGE
52-2-0	CARGO COMPARTMENT DOORS (CONT)	
	Removal/Installation - Cargo Door Exterior Handle Assembly	407
	Removal/Installation - Cargo Door Exterior Handle	410
	Removal/Installation - Cargo Compartment Door Control Handle Linkage	411
	Removal/Installation - Bayonet Pin Linkage	412
	Adjustment/Test Door Fair-in and Latch	501
	Inspection/Check - Cargo Doors	601
	Approved Repairs - Interior Handle Trigger Release Actuator Pin	801
52-3-0	GROUND SERVICING ACCESS DOORS	
	General	1
	External Power Receptacle Door	1
	Fresh Water Filler Door	1
	Forward and Aft Lavatory Service Doors	1
	Ground Turbine Compressor Connection Door	1
	Tow Power Receptacle	3
	Removal/Installation - Ground Servicing Doors	201
	Inspection/Check - Ground Servicing Doors	201
52-4-0	EQUIPMENT COMPARTMENT DOORS	
	General	1
	Removal/Installation - Equipment Compartment Door Control Handle Linkage	201
52-4-1	ELECTRICAL COMPARTMENT "TUNNEL" DOORS	
	Description	1
	Removal/Installation - Left and Right "Tunnel" Access Doors	401
	Adjustment/Test - Electrical Compartment "Tunnel" Doors	501
	Inspection/Check - Electrical Compartment "Tunnel" Doors	601
52-4-2	ELECTRONIC COMPARTMENT DOOR	
	Description	1
	Removal/Installation - Electronic Compartment Door	401
	Removal/Installation - Electronic Compartment Door Pressure Seal	401

TABLE OF CONTENTS (CONT)

CHAPTER SECTION	SUBJECT	PAGE
52-4-2	ELECTRONIC COMPARTMENT DOOR (CONT)	
	Adjustment/Test - Electronic Compartment Door.....	501
	Inspection/Check - Electronic Compartment Door.....	601
52-4-3	HYDRAULIC COMPARTMENT DOOR	
	Description.....	1
	Removal/Installation - Hydraulic Compartment Door.....	401
	Removal/Installation - Hydraulic Compartment Door Pressure Seal.....	401
	Adjustment/Test - Hydraulic Compartment Door.....	501
	Inspection/Check - Hydraulic Compartment Door.....	601
52-4-4	NOSE WHEEL WELL DOOR	
	Description.....	1
	Removal/Installation - Nose Wheel Well Door.....	401
	Removal/Installation - Nose Wheel Well Door Pressure Seal.....	401
	Inspection/Check - Nose Wheel Well Door.....	601
52-4-5	NOSE LANDING GEAR DOWN-LOCK INSPECTION DOOR	
	Description.....	1
52-4-6	AIR CONDITIONING AND PRESSURIZATION COMPARTMENT DOORS	
	General.....	
	Cabin Turbocompressor Access Doors.....	1
	Heat Exchanger Access Door.....	1
	Refrigeration Package Access Doors.....	1
	Removal/Installation - Cabin Turbocompressor Access Doors.....	201
	Removal/Installation - Heat Exchanger Access Doors.....	203
	Removal/Installation Refrigeration Package Access Doors.....	205
	Inspection/Check - Air Conditioning and Pressurization Compartment Doors.....	208
52-4-7	AFT FUSELAGE DOORS	
	Description.....	1
	Removal/Installation - Aft Fuselage Doors.....	201
	Inspection/Check - Aft Fuselage Doors.....	203

TABLE OF CONTENTS (CONT)

CHAPTER SECTION	SUBJECT	PAGE
52-5-0	CABIN INTERIOR DOORS	
	General	1
52-5-1	FLIGHT COMPARTMENT DOOR	
	Description	1
	Removal/Installation - Flight Compartment Door	201
52-5-2	LAVATORY DOORS, FORWARD AND REAR	
	Description	1
	Removal/Installation - Lavatory Doors	201
52-5-3	ELECTRICAL AND ELECTRONIC COMPARTMENT INFLIGHT ACCESS DOOR	
	Description	1
	Removal/Installation - Electrical and Electronic Compartment Inflight Access Door	201
52-6-0	DOOR-OPEN WARNING SYSTEM	
	General	1
	Door-Open Warning System - Trouble Shooting	101
	Removal/Installation - Main Entrance and Service Door Microswitches	201
	Removal/Installation - Cargo and Equipment Access Door Microswitches	203
	Adjustment/Test - Door-Open Warning System	205

Chapter 52

DOORS - DESCRIPTION AND OPERATION

1. General

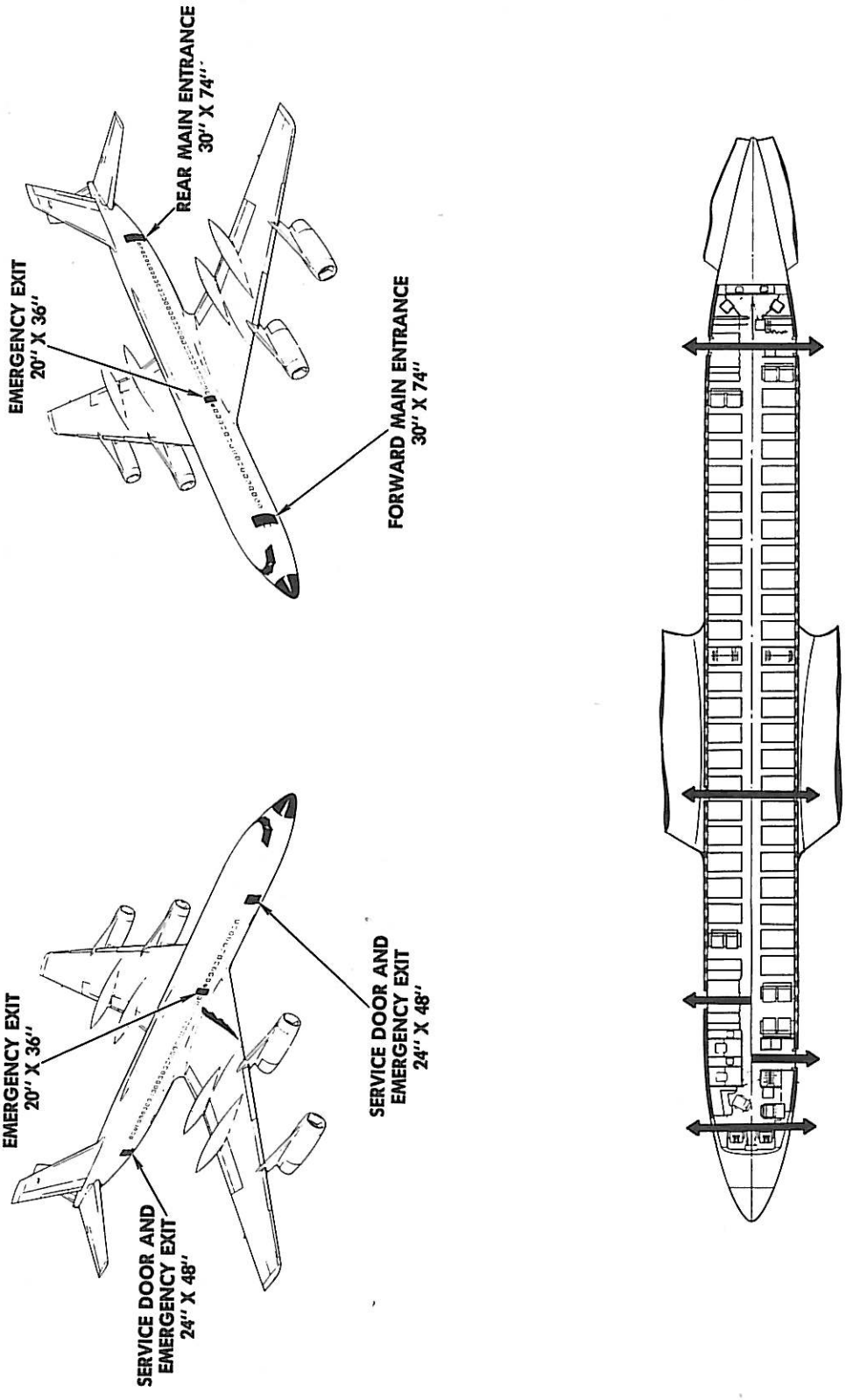
The airplane entrance and access doors are as follows: the cabin exterior doors, the cargo compartment doors, the ground servicing doors, the equipment compartment doors and the cabin interior doors. See Figures 1 and 2 for the locations of these various doors.

All exterior doors in the pressurized areas of the airplane are plug-type and open inward, except for the main entrance and service doors. The inward opening, plug-type doors consist of the two emergency exit doors over the wing, the nose wheel well door, both electrical compartment doors, the hydraulic compartment door, and the electronic compartment door. Also included are the inward opening horizontal sliding plug-type cargo compartment doors. All inward opening doors are held closed by bayonet-type latching mechanisms and by cabin pressure.

The main entrance and service doors are vertically sliding, plug-type doors and open outward. These doors are restrained in the closed position by continuous vertical tracks along their forward and aft edges, and stationary "T" hooks and pins on their upper and lower edges. Each main entrance and service door also contains a fail-safe interlock mechanism which prevents the door from inadvertently opening. When door is open, the interlock mechanism also prevents lowering of door to prevent damaging the hinge fairing.

The outward opening access doors consist of the flare chute doors, ground servicing doors, air conditioning and pressurization compartment doors and the aft fuselage doors. These doors are of the nonpressure type and are located outside the pressurized areas. Either Camloc or Hartwell fasteners are used to secure these access doors, except the flare chute doors; refer to Chapter 25, EQUIPMENT/FURNISHINGS, for additional information in reference to flare chute doors (for those airplanes equipped with flare chute doors).

Eight door-open warning lights are located on the flight crew's instrument panels to alert the flight crew to any unsafe door condition; refer to Chapter 33, LIGHTS, for locations. For those airplanes equipped with a baggage door, there are nine door open warning lights. The lights are controlled by microswitches on the following fuselage exterior doors: forward main entrance door, rear main service door, forward service door, rear service door, electronic compartment door, forward cargo compartment door, aft cargo compartment door, the hydraulic compartment door, and the baggage door (for those airplanes equipped with a baggage door).



Passenger Cabin Doors and Emergency Exit Locations
Figure 1

General Arrangement of Fuselage Doors
Figure 2

PRESSURE SEALS - MAINTENANCE PRACTICES

1. Removal/Installation Pressure Seals (See Figures 201, 202, and 203)

NOTE: This procedure is applicable to both the molded bulb type wire reinforced pressure seals used on the forward and aft main entrance doors, the forward and aft service door, and sliding type cargo doors; and the flat molded-flange type seal used on the electrical compartment, electronic compartment, and hydraulic compartment doors. Refer to 52-1-5 for emergency exit door pressure seal removal/installation.

A. Equipment Required.

(1) Locally manufactured insertion tool as shown in Figure 201 or equivalent.

B. Preparation.

(1) Remove cargo doors as directed in 52-2-0.

(2) Remove hydraulic compartment door as directed in 52-4-3.

C. Remove Pressure Seal.

(1) Insert tapered end of the insertion tool between side of seal and retainer.

(2) Pry retaining flange of seal out of retainer; being careful not to deform the integral wire spring in seal, where applicable.

CAUTION: DO NOT USE SCREWDRIVER OR SIMILAR SHARP POINTED INSTRUMENT TO REMOVE SEAL FROM RETAINER.

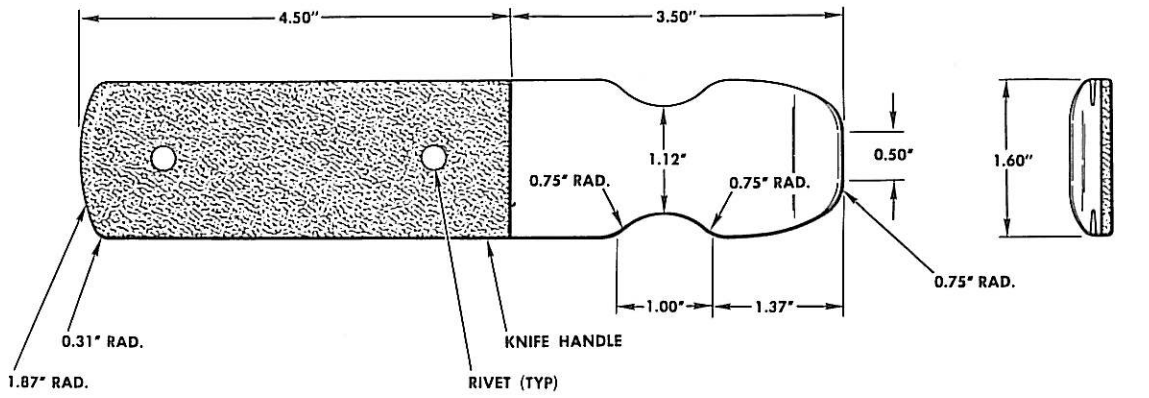
(3) Repeat steps (1) and (2) around entire periphery of door and remove seal.

D. Install Pressure Seal.

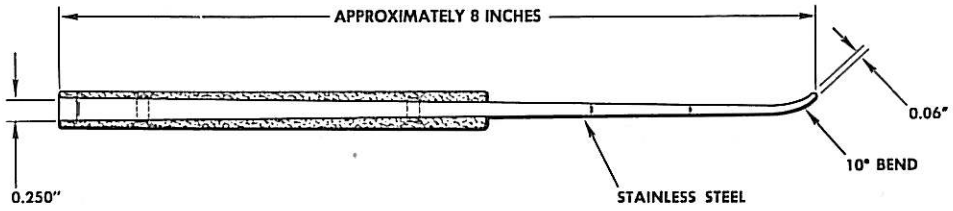
(1) Check that sides of seal retainer around entire periphery of door are symmetrical so that seal will seat properly when installed.

(2) Position the seal so its molded corners, where applicable, are located at corners of door. Vent holes shall face inboard (toward pressurized side of door).

NOTE: The seal circumference, prior to seal installation, is smaller than that of the seal retainer; however, as the seal is installed it "grows" to fit retainer.

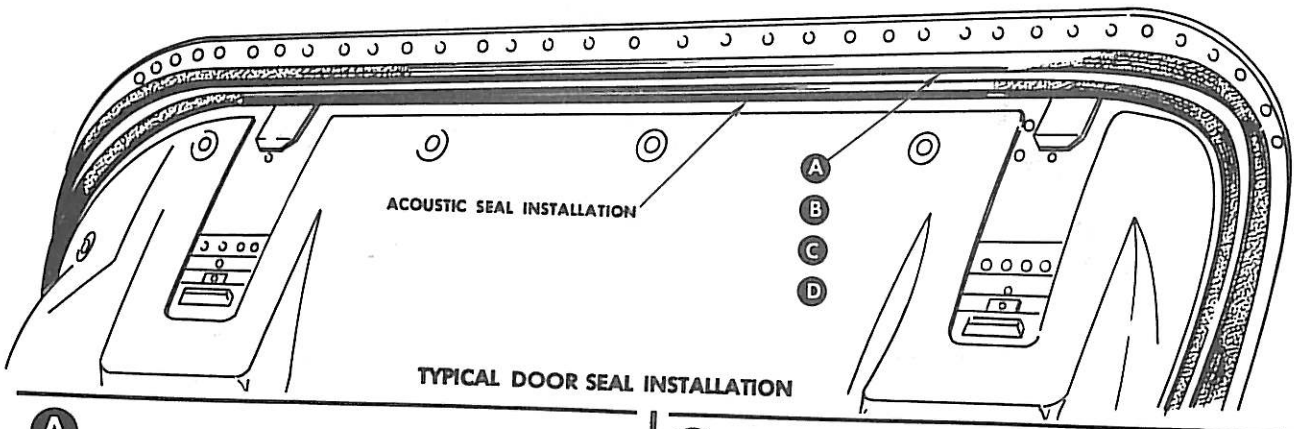


NOTE:
ROUND OFF AND
SMOOTH ALL SHARP EDGES.



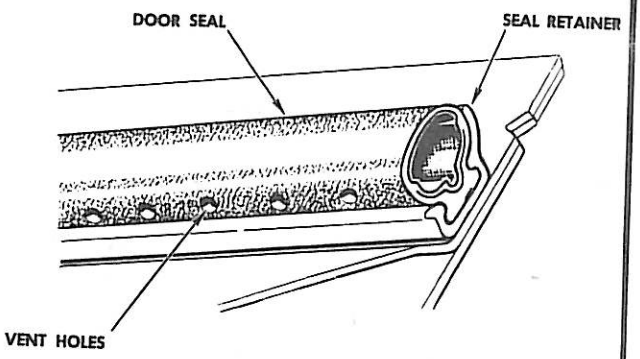
STAINLESS STEEL INSERTION TOOL DIMENSIONS

22.02.52.057-2A



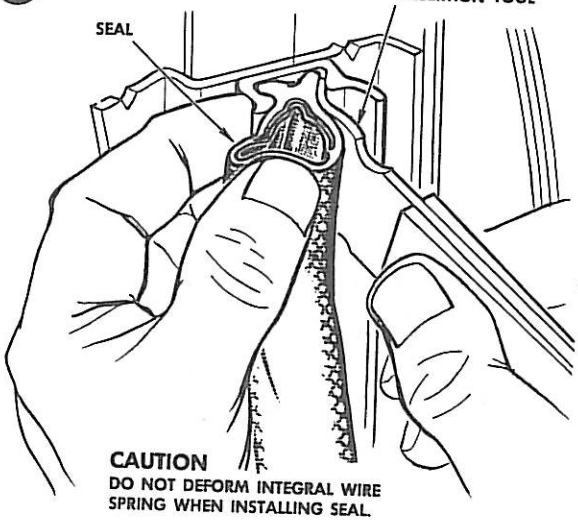
TYPICAL DOOR SEAL INSTALLATION

A



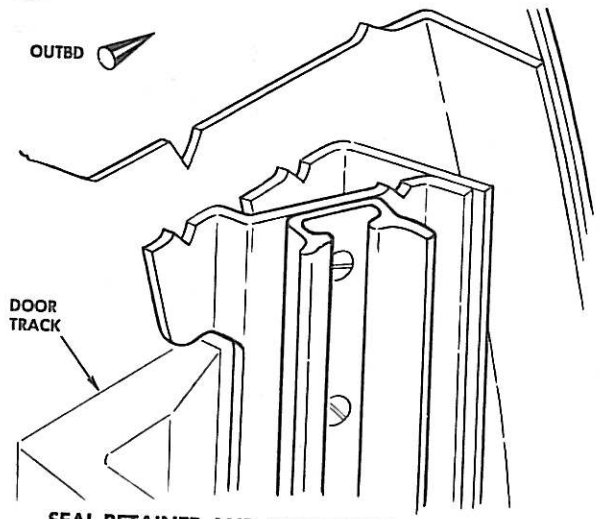
SEAL VENT HOLES—TYPICAL

B



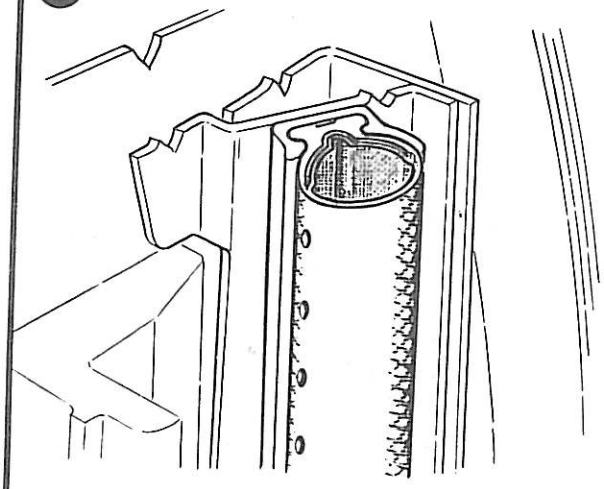
METHOD OF INSTALLING SEAL

D



SEAL RETAINER AND SUPPORTING STRUCTURE

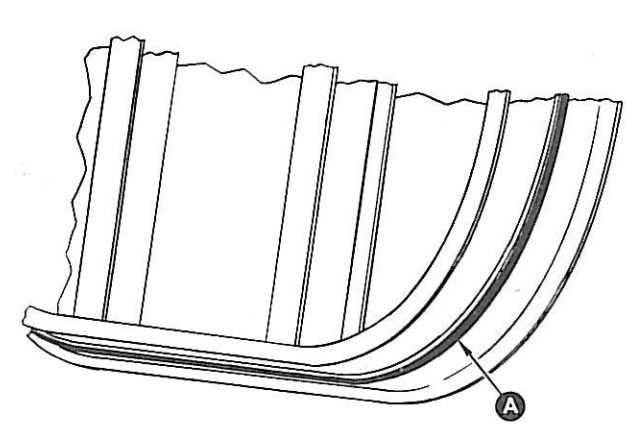
C

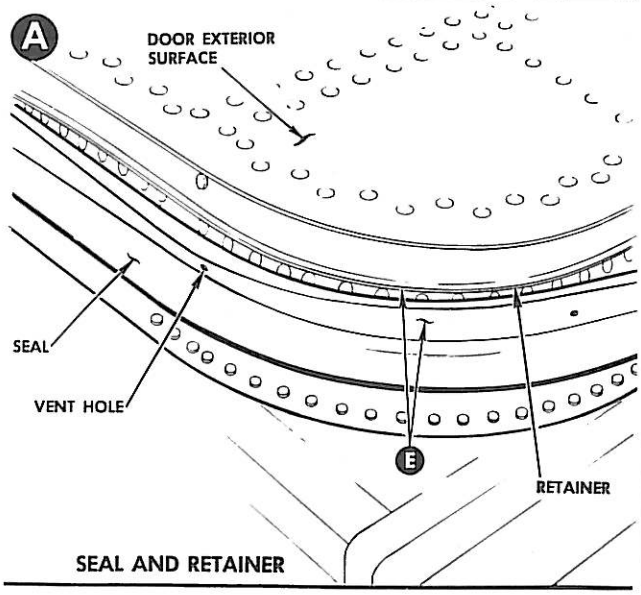


SEAL INSTALLATION COMPLETE

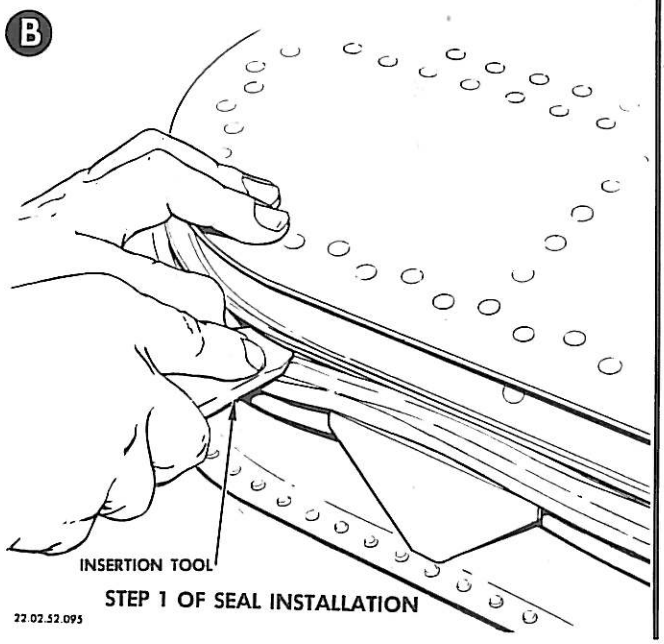
22.02.52.093

Pressure Seal Installation - Molded Bulb Type - Wire Reinforced-Seal
Figure 202



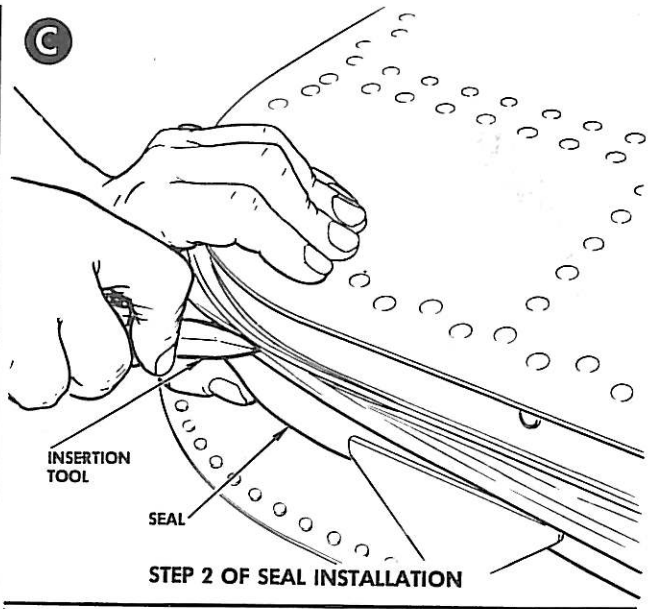


SEAL AND RETAINER

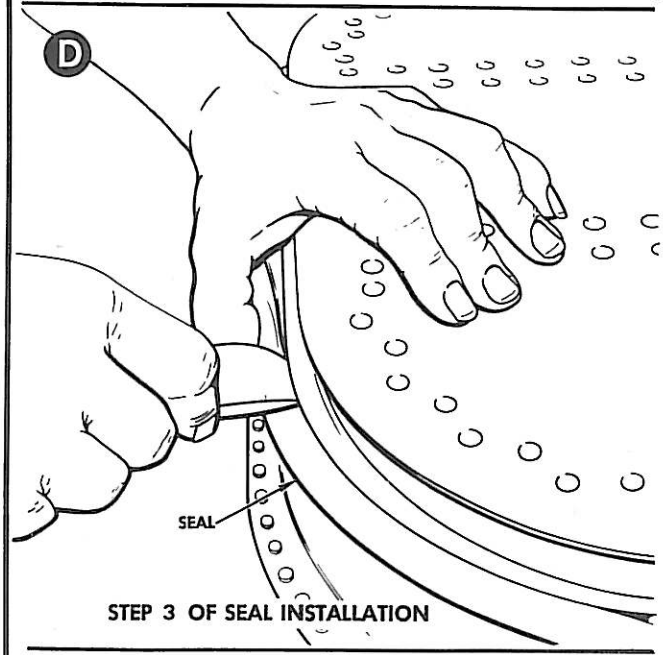


STEP 1 OF SEAL INSTALLATION

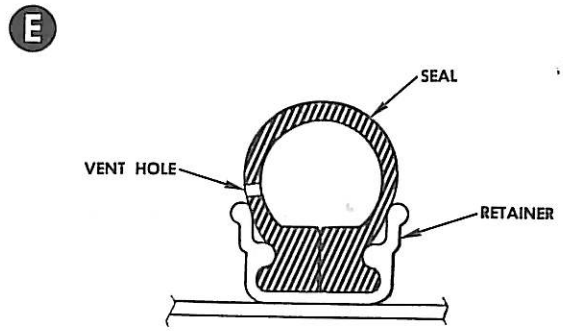
22.02.52.095



STEP 2 OF SEAL INSTALLATION



STEP 3 OF SEAL INSTALLATION



SEAL INSTALLED

Pressure Seal Installation -
Flat Molded Flange Seal
Figure 203

(3) For molded bulb type wire-reinforced pressure seals, start at top center between two upper corners of door and install seal as follows:

(a) Twist seal slightly and insert outside molded retaining flange of seal under corresponding lip in door seal retainer.

(b) With fingers, apply pressure against crown of seal to hold seal in position in outside lip of door seal retainer.

(c) Using tapered end of insertion tool, apply down and inward pressure against the exposed inside molded retaining flange of the seal, forcing the inside seal flange under lip of door seal retainer.

CAUTION: CARE MUST BE EXERCISED WHEN INSTALLING THE SEAL SO AS NOT TO PINCH SIDES OF SEAL TOGETHER AND DEFORM THE INTEGRAL WIRE SPRING. DO NOT USE SCREWDRIVER OR SIMILAR SHARP POINTED INSTRUMENT TO INSTALL SEAL.

(4) Working in both directions from top center of door repeat steps (3)(a) through (3)(c), until seal is installed around the two upper corners.

(5) Insert small portions (approximate width of insertion tool) of inside seal flange under door seal retainer at one time.

NOTE: Install seal around corners of door so that seal is not drawn in or wrinkled. If wrinkles exist, grasp seal below corner of door seal retainer and pull slightly until wrinkles disappear.

(6) After seal is installed along upper edge and around the two upper corners of the door, install seal along forward and aft edges of door in the same manner as the upper seal installation. During installation of seal along forward and aft edges of door where hinge point and track interference is noted, use insertion tool with curved end of tool facing away from door, for easier access to door seal retainer.

(7) Working in both directions from bottom center of door, repeat steps (3)(a) through (3)(c). During installation of seal along bottom edge of door where door pin interference is noted, make use of notches in insertion tool for easier access to seal retainer.

NOTE: When seal installation is complete, the seal crown should be smooth around entire periphery of door. Vent holes must be visible along the inboard leg of retainer.

(8) For flat molded-flange seal, omit steps D.(3) through D.(7), start at any corner, engage at least one insertion tool width of the seal as follows:

(a) Loop lower lip of seal over and position inside edge against base of inserted lip as shown in Figure 203.

(b) Using tapered end of insertion tool, insert lip of seal (vent hole side) into corresponding lip in the seal retainer as shown in Figure 203. Tuck in a minimum of one tool width of the seal and continue with the following step.

(c) As shown in Figure 203, apply an inward pressure against the exposed flange of seal and push flange under lip of retainer sufficiently to engage both lips of seal in an area at least as wide as the tool.

CAUTION: DO NOT USE A SCREWDRIVER OR SIMILAR SHARP POINTED INSTRUMENT TO INSTALL SEAL. DO NOT SLIDE TOOL ALONG SEAL UNDER LIP OF RETAINER OR SEAL WILL BE DAMAGED. TAKE CARE NOT TO STRETCH SEAL ANY MORE THAN IS NECESSARY.

(9) Moving in turn to each of the remaining door corners, distribute seal slack evenly and engage at least one tool width of the seal by repeating steps (8)(a) through (8)(c).

(10) Working to the left from the last corner installed, engage seal continuously from one corner to the next by a continuous repetition of steps (8)(a) through (8)(c), using the left thumb to guide seal lips into the retainer.

CAUTION: AS SEAL IS INSTALLED, SLACK MAY BUILD UP BETWEEN THE ENGAGED AREAS. IF THIS CONDITION OCCURS, ENGAGE SEAL AT THE MIDDLE OF THE SLACK AREA AND WORK BOTH WAYS TO REDISTRIBUTE SLACK TO ENGAGED AREAS. AVOID UNNECESSARY STRETCHING OF SEAL.

2. Adjustment of Molded Bulb Type Wire - Reinforced Pressure Seal (see Figure 204)

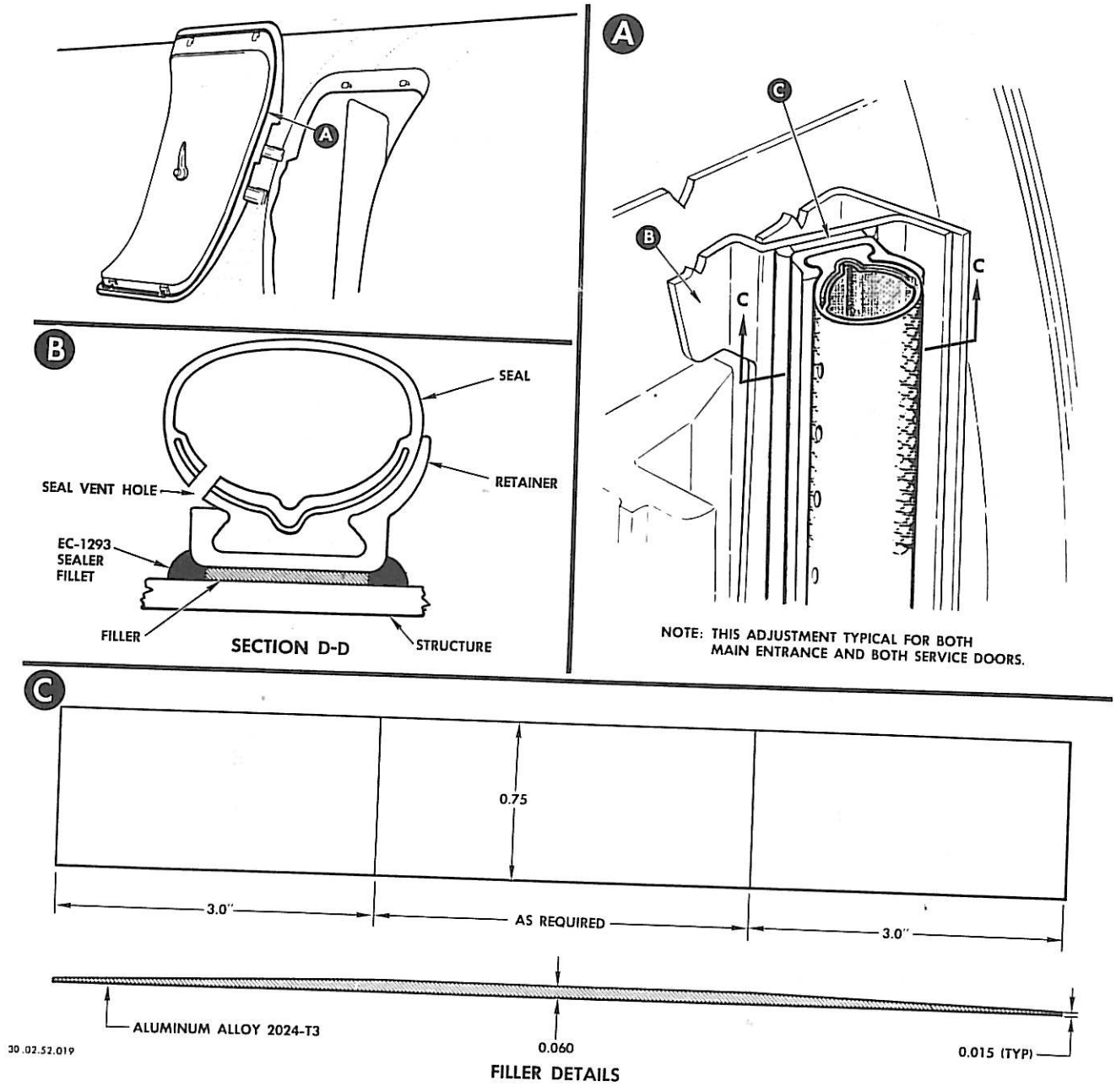
A. Equipment Required.

(1) Chalk or marker dye.

(2) Filler material - 2024-T3 aluminum alloy, 0.060 inch thick, lengths as required.

(3) EC 1291 sealer, 3M Co., St. Paul 6, Minn., or equivalent.

(4) Aliphatic naphtha, Federal Specification TT-N-95a.


A
B
SEAL
RETAINER
SEAL VENT HOLE
EC-1293
SEALER
FILLET
FILLER
STRUCTURE
SECTION D-D
C
NOTE: THIS ADJUSTMENT TYPICAL FOR BOTH
MAIN ENTRANCE AND BOTH SERVICE DOORS.
0.75
3.0"
AS REQUIRED
3.0"
ALUMINUM ALLOY 2024-T3
0.060
0.015 (TYP)
30.02.52.019
FILLER DETAILS

B. Leak Area Determination.

Areas where seal does not make full contact with the door striker may be determined by applying chalk or marker dye to the striker, closing and opening the door, and then observing the seal. Leak areas may also be located by pressurizing the airplane and listening or feeling for air leaks at the outside.

C. Adjust Seal.

(1) In the area of the leak, remove the seal from the retainer.

(2) Remove retainer screws in the area of the leak and loosen adjacent screws so that the retainer may be displaced enough to install fillers under the base of the retainer.

(3) Measure and cut a length of filler material long enough to bridge the leak area. Taper ends as shown on Figure 204.

NOTE: Fillers may be cut into short lengths to eliminate forming difficulties in contoured areas.

(4) Clean faying surfaces in substructure, fillers, and retainer with a clean cloth moistened with aliphatic naphtha.

(5) Install fillers and tighten screws.

(6) Apply fillet of EC 1291 sealer on each side of retainer at juncture of retainer base and substructure.

(7) Install seal in retainer.

3. Approved Repair - Pressure Seal (see Figure 205)

The following door pressure seal repair is applicable to the main entrance, service, cargo, hydraulic, and electronic compartment doors.

A. Equipment Required.

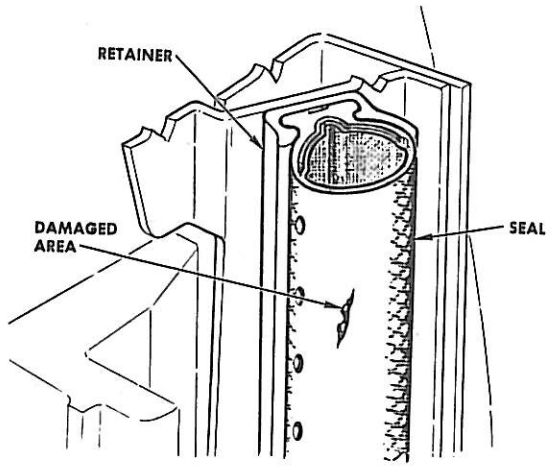
(1) Patch material - 4755 dacron fabric, Los Angeles Standard Rubber Co., 1500 E. Gage Ave., Los Angeles 1, Calif., or equivalent.

(2) Adhesive - RTV silastic 140, Dow Corning Corp., Midland, Mich., or equivalent.

(3) Aliphatic naphtha, Federal Specification TT-N-95a.

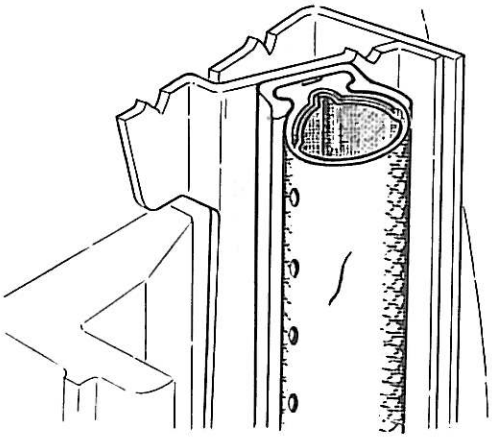
(4) Sandpaper No. 280 grit, or finer.

A



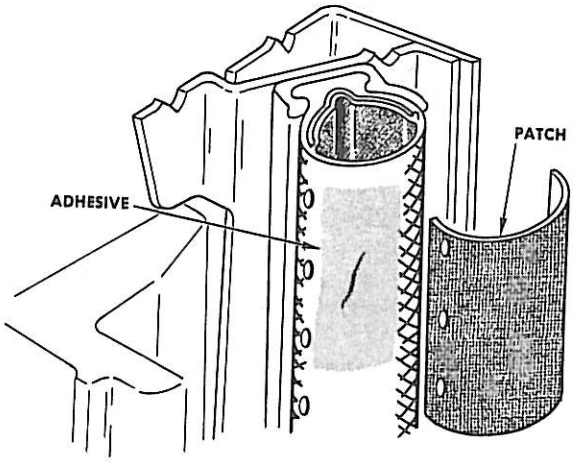
DAMAGED AREA

B



SMOOTHED AND READY FOR PATCH

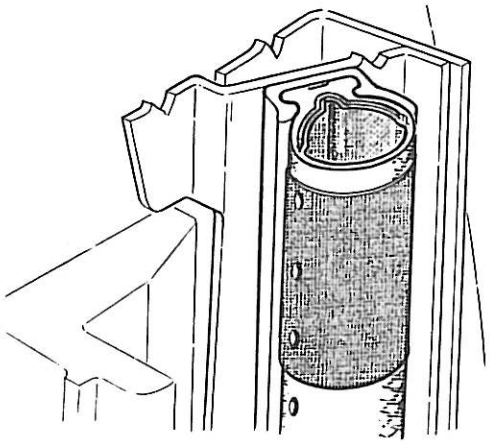
C



INSTALL PATCH OVER FULL WIDTH OF SEAL CROWN

D

NOTE:
MAKE SURE SEAL VENT HOLES IN PATCH ALIGN WITH EXISTING VENT HOLE IN SEAL.



PATCH INSTALLED

30.02.52.018

NOTE: Adhesive 910, Eastman Chemical Products Inc., Kingsport, Tenn., may be used for a temporary quick fix only. This adhesive has fast drying properties (cures in approx. 30 minutes at 70 degrees F) but does not have the permanent adhesive properties of Adhesive RTV silastic 140.

B. Repair Seal.

(1) Smooth damaged area and clean seal with aliphatic naphtha, Federal Specification TT-N-95a.

(2) Apply a thin coat of adhesive over the damaged area. The adhesive should extend approximately 1.50 inches on each side of the damaged area and over the full width of the seal crown. If a hole has been worn in the seal, attempt to keep the adhesive out of the hole.

WARNING: DO NOT ALLOW ADHESIVE #910, IF USED, TO CONTACT ANY AREA OF THE HUMAN BODY.

(3) Apply the patch with the fabric side up a minimum of 1.00 inch on each side of the damaged area and over the full width of the seal crown. Rub out wrinkles and air bubbles by working outward from center of patch, fair in the adhesive along edges of patch.

(4) Allow the adhesive to cure for a minimum of four hours at approximately 70 degrees F.

(5) Smooth repaired area with sandpaper No. 280 grit or finer if required.

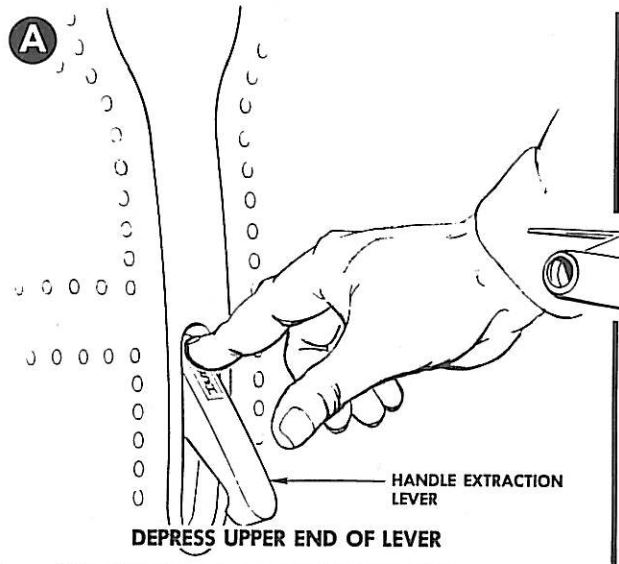
CABIN EXTERIOR DOORS - DESCRIPTION AND OPERATION

1. General

The cabin exterior doors include the forward and rear main entrance doors on the left side of the fuselage, the forward and rear service doors on the right side of the fuselage, and an emergency exit on each side above the wing. The main entrance and service doors are wedge shaped and open outward; the emergency exits are rectangular shaped and open inward.

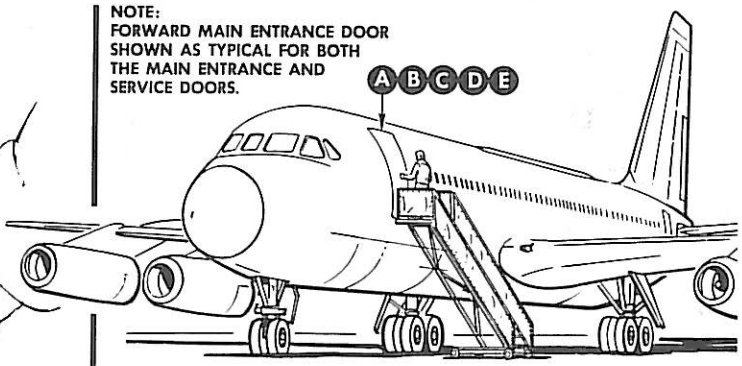
The main entrance doors and service doors are sliding plug-type doors. They are so named because of their vertical sliding action into a tapered fuselage opening. The forward edges of these doors are nearly vertical while the aft edges are canted, thus giving a wedging action when the doors are closed. Continuous vertical tracks along the forward and aft edges of the door openings restrain the main entrance and service doors in the closed position. Two stationary "T" hooks at the door header and two door bottom edge pins through the fuselage threshold secure the top and bottom edges of the doors. The door operating mechanism cinches the doors down by means of a cable system, and actuates an interlock mechanism pin on the forward edge of the door to keep the door down and closed in the event of cable failure. The "cinch-down" load and the interlock actuating pin engagement is maintained by overcenter action of the door operating mechanism, augmented by a counterbalance spring. All door control handles inside the airplane operate in a counterclockwise direction to open the doors. All door control handles on the outside of the airplane operate in a clockwise direction to open the doors. A spring-loaded hold-open hook in the lower hinge arm linkage of each door secures the door when in the full open position. See Figure 1 for an illustration showing main entrance and service door operation from outside the airplane. Figure 2 shows main entrance and service door operation from inside the airplane.

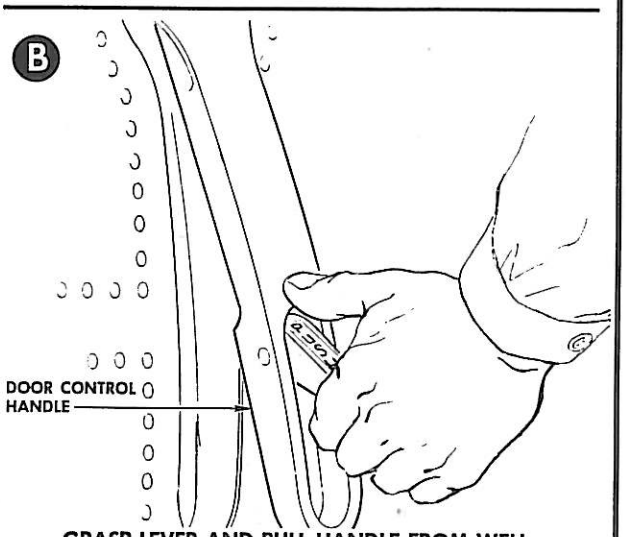
The emergency exits located over the wing are conventional plug-type inward opening doors. These emergency doors are secured in place by a latch mechanism at the upper edge of the doors. Two hooks secure the lower edges. Figure 3 shows emergency exit door operation from both outside and inside the airplane.



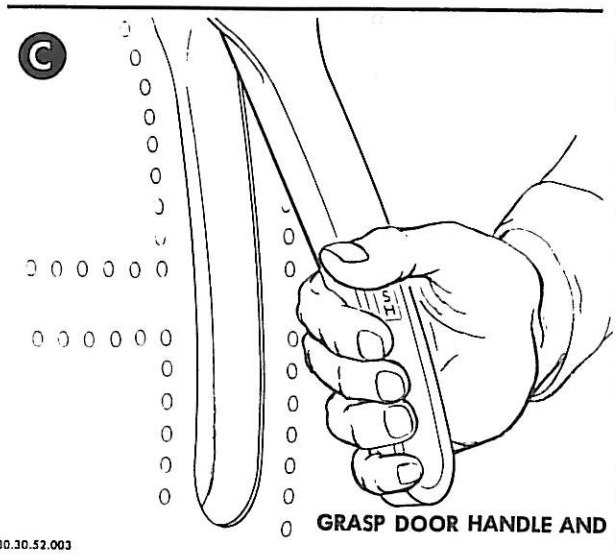
DEPRESS UPPER END OF LEVER

NOTE:
FORWARD MAIN ENTRANCE DOOR SHOWN AS TYPICAL FOR BOTH THE MAIN ENTRANCE AND SERVICE DOORS.

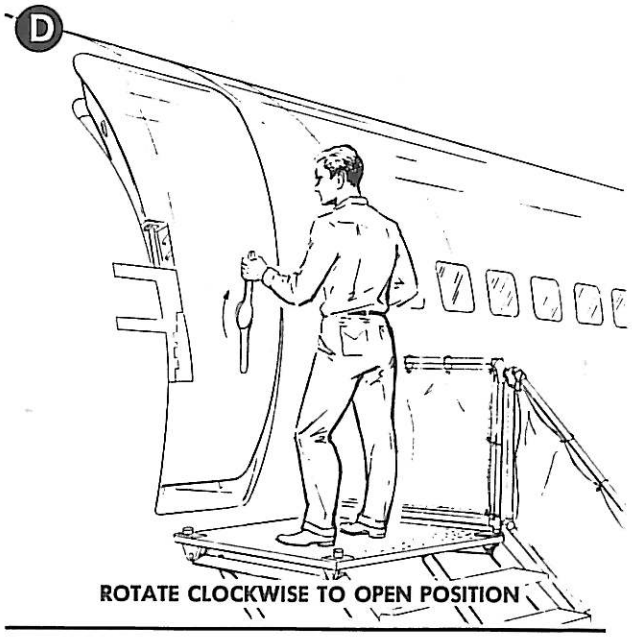




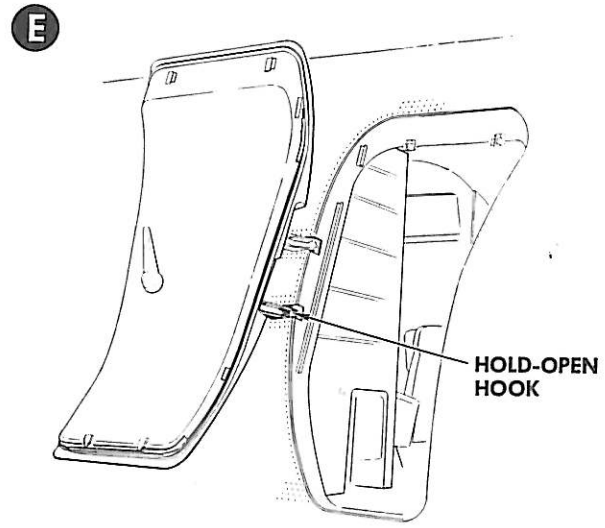
GRASP LEVER AND PULL HANDLE FROM WELL



GRASP DOOR HANDLE AND



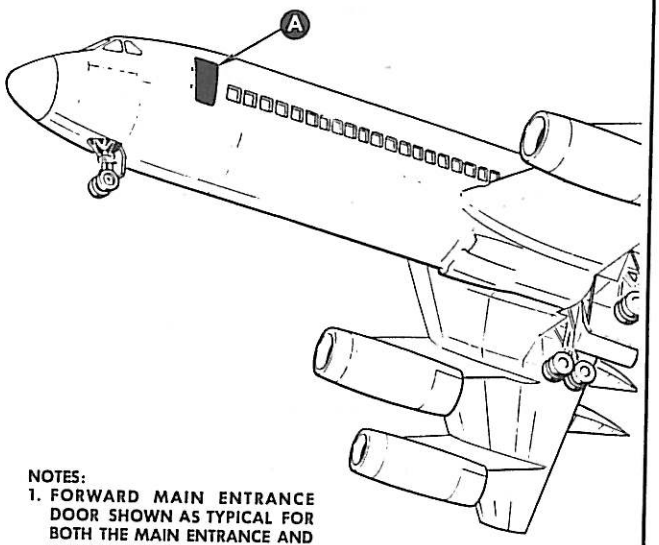
ROTATE CLOCKWISE TO OPEN POSITION



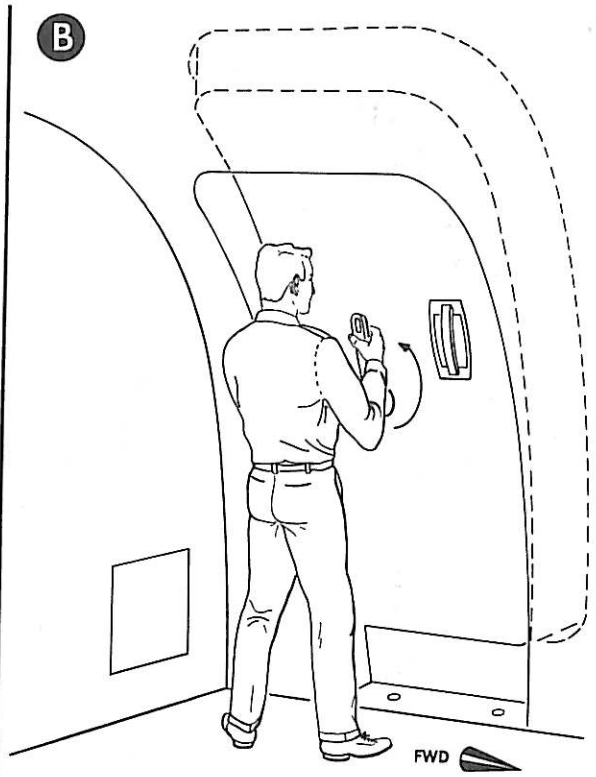
SWING DOOR TO FULL OPEN POSITION AND SECURE WITH HOLD-OPEN HOOK

30.30.52.003

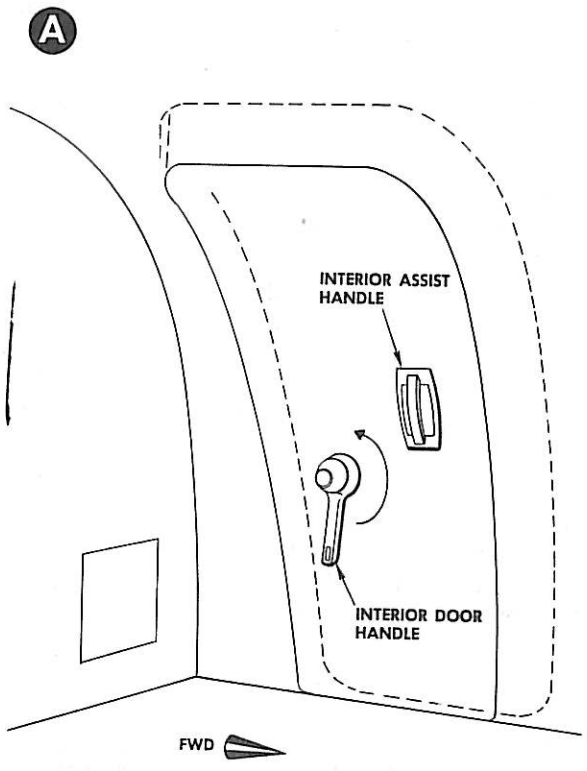
Main Entrance and Service Door
Operation from Exterior
Figure 1



NOTES:
1. FORWARD MAIN ENTRANCE DOOR SHOWN AS TYPICAL FOR BOTH THE MAIN ENTRANCE AND SERVICE DOORS.
2. THE MAIN ENTRANCE DOORS HAVE INTERIOR ASSIST HANDLES, THE SERVICE DOORS DO NOT.

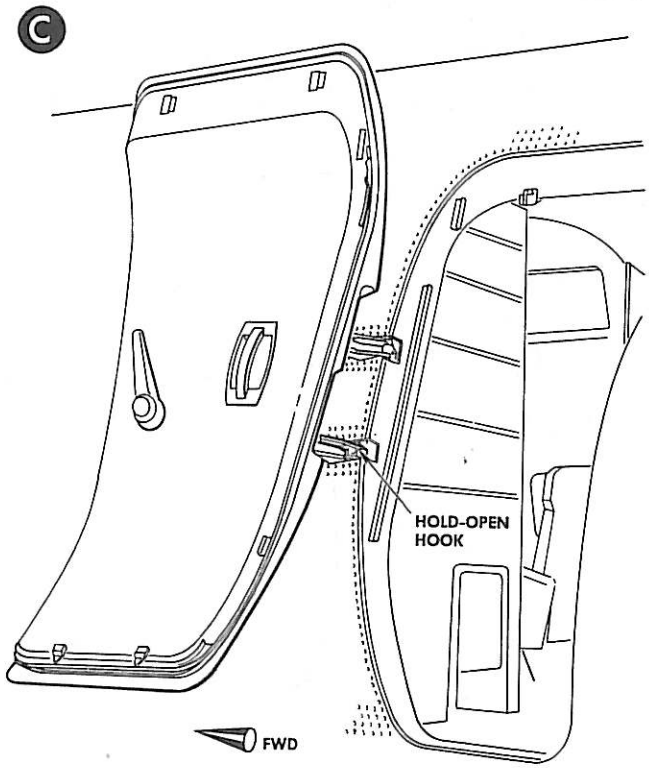


GRASP INTERIOR DOOR HANDLE AND ROTATE COUNTER CLOCKWISE TO OPEN POSITION.

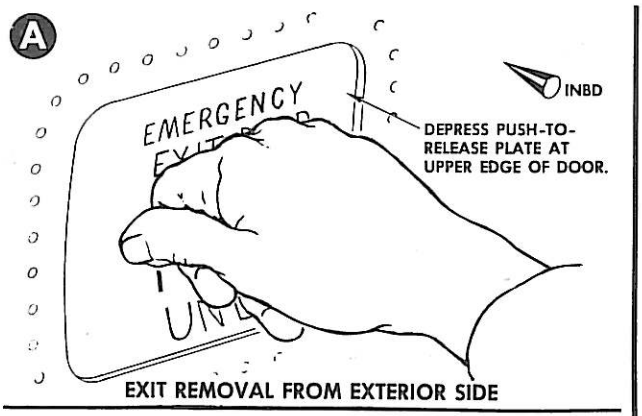


INTERIOR DOOR HANDLE POINTS DOWNWARD WHEN DOOR IS CLOSED AND LOCKED. TO OPEN—

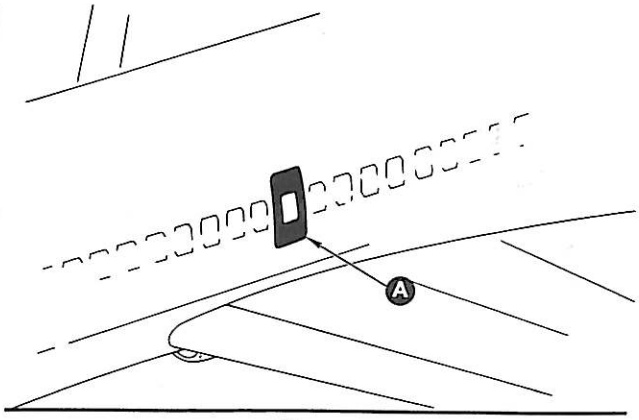
30.30.52.004

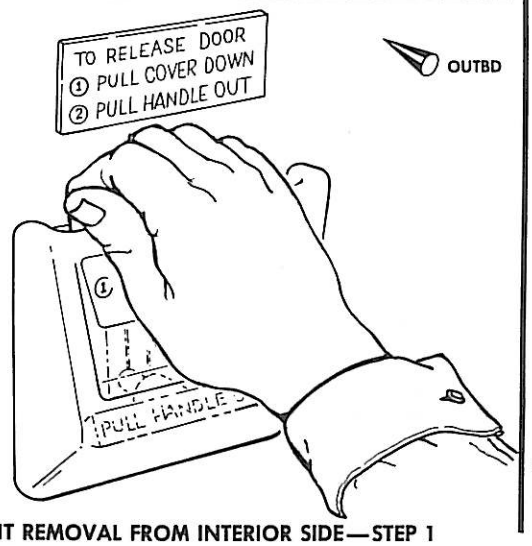


SWING DOOR OUTWARD AND FORWARD UNTIL SECURED BY HOLD-OPEN HOOK.

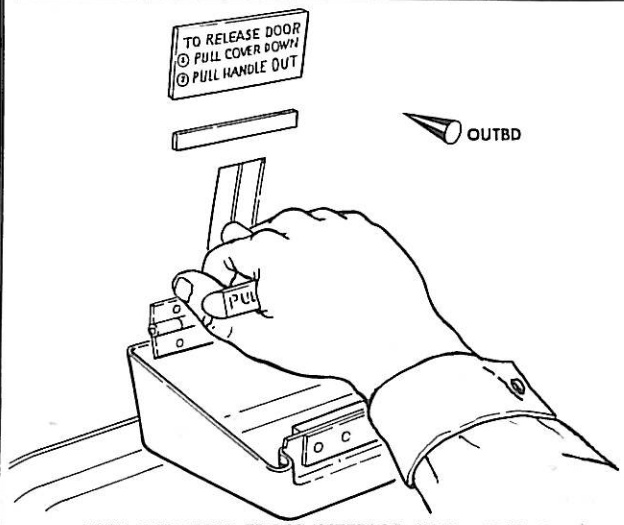


EXIT REMOVAL FROM EXTERIOR SIDE

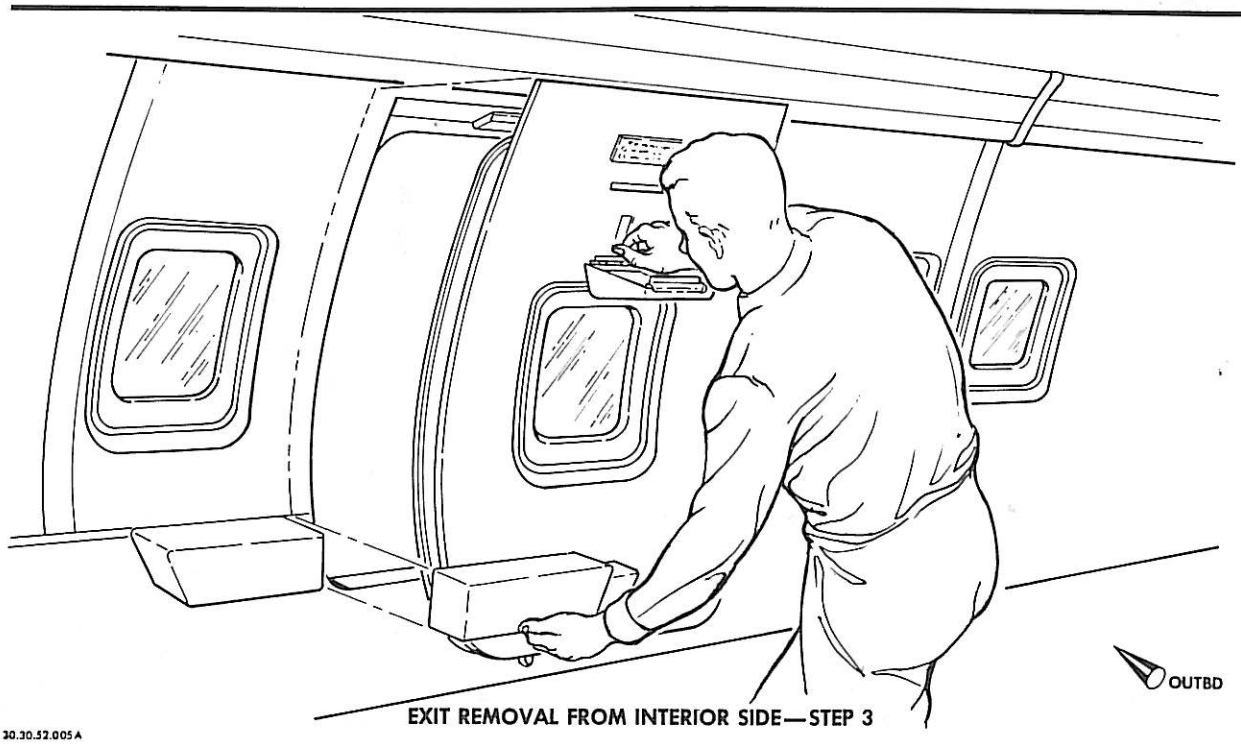




EXIT REMOVAL FROM INTERIOR SIDE—STEP 1



EXIT REMOVAL FROM INTERIOR SIDE—STEP 2



EXIT REMOVAL FROM INTERIOR SIDE—STEP 3

30.30.52.005 A

MAIN ENTRANCE AND SERVICE DOORS MECHANISMS - REMOVAL/INSTALLATION

1. Removal/Installation Main Entrance and Service Door Quadrant (see Figure 401)

NOTE: The removal/installation procedure for the main entrance and service door quadrants are similar; therefore, the following procedure is applicable for all these doors.

A. Equipment Required.

(1) Calibrated cable tensiometer capable of measuring tension loads of 270 to 770 pounds.

(2) Spring scale to check door handle operating loads.

(3) Torque wrench calibrated in inch-pounds.

(4) Corrosion Preventive, Specification MIL-C-16173A, Grade 1.

(5) EC1293 Sealer, 3M Co., St. Paul 6, Minn., or equivalent.

(6) Wood block approximately 9 inches long to support door in raised position.

B. Procedure

WARNING: ENSURE AGAINST DOOR HANDLE BEING MOVED INADVERTENTLY. IF HANDLE IS NOT HELD AS IT MOVES OVER CENTER IT IS DANGEROUS AS THE COUNTERBALANCE SPRING MOVES THE HANDLE WITH A FORCE IN EXCESS OF 70 POUNDS.

NOTE: Bag and tag all loose hardware for ease of reinstallation.

(1) Remove necessary door interior trim and soundproofing to gain access to the door interior; refer to Chapter 25, EQUIPMENT/ FURNISHINGS.

(2) Remove exterior door handle and shaft, refer to Paragraph 8.

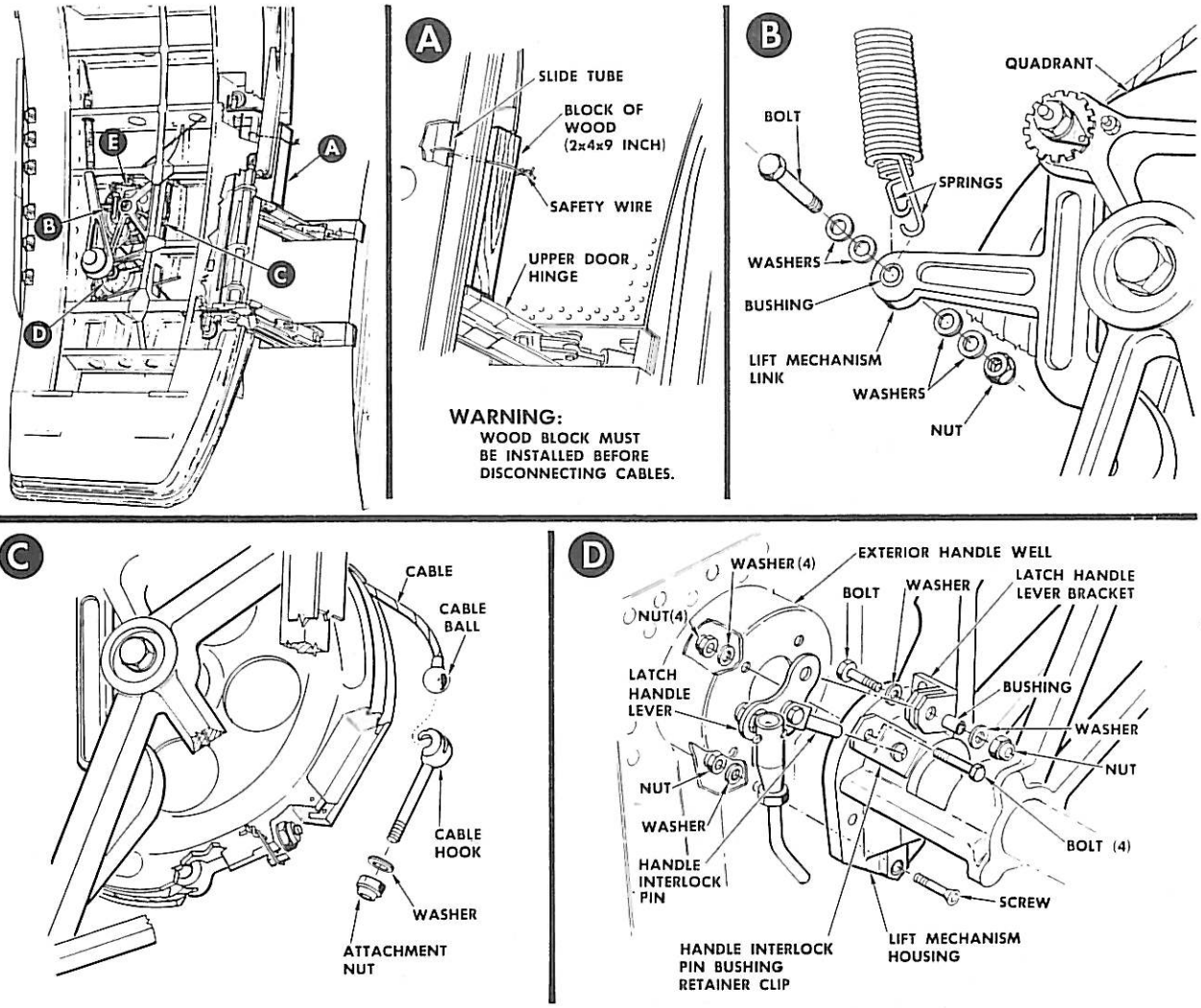
(3) Install wood block between upper door hinge and upper door hinge skin cutout. Safety wire block to hinge slide tube.

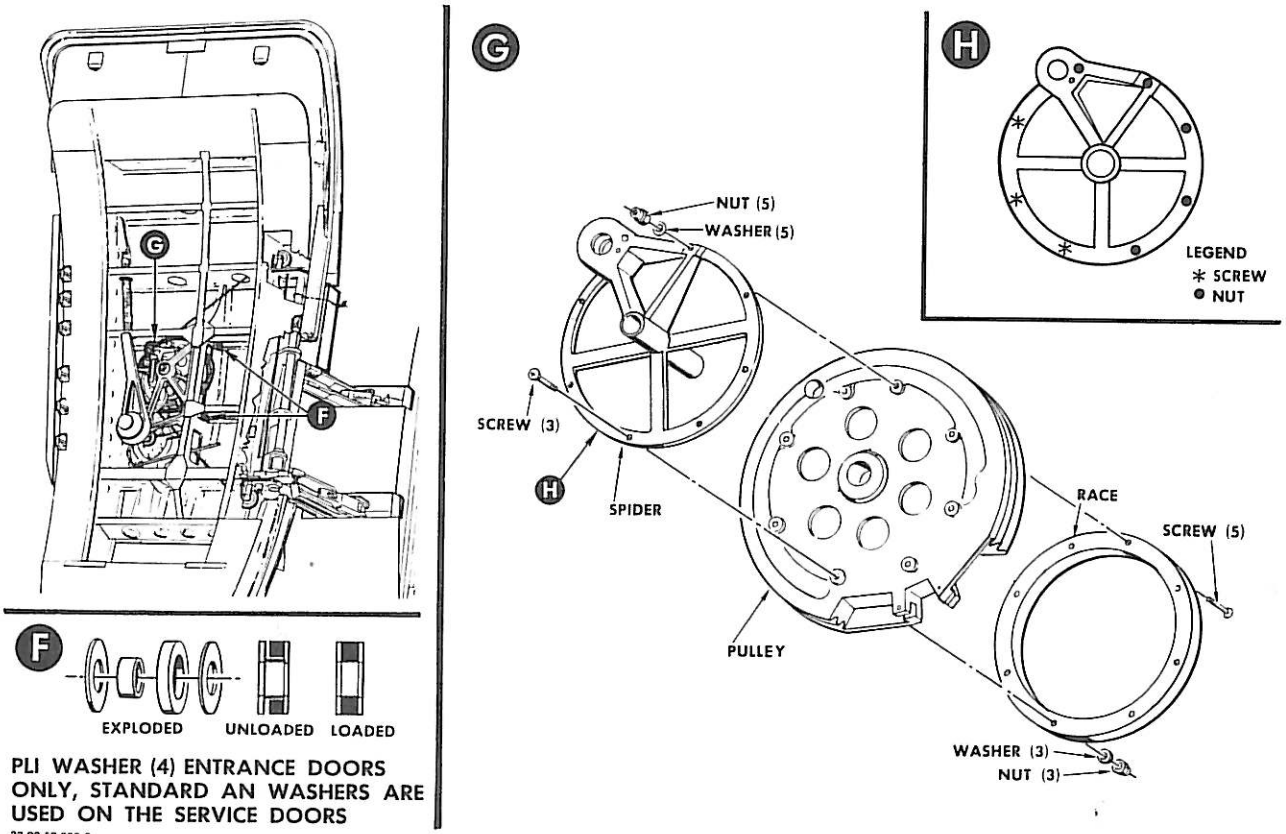
WARNING: WOOD BLOCK MUST BE INSTALLED PRIOR TO NEXT STEP TO PREVENT DOOR FROM DROPPING.

(4) Exercising care, disconnect lower end of entrance door springs from entrance door lift-mechanism link. Secure bushing in bolt hole on lift mechanism after removal of entrance door springs.

(5) Loosen nuts on cable hooks at cable quadrant; disconnect, and remove cables from quadrant.

(6) Remove bolt attaching latch handle to bracket on lift-mechanism housing.


A
B
C
D
E
SLIDE TUBE
BLOCK OF WOOD (2x4x9 INCH)
SAFETY WIRE
UPPER DOOR HINGE
WARNING:
WOOD BLOCK MUST BE INSTALLED BEFORE DISCONNECTING CABLES.
QUADRANT
BOLT
SPRINGS
WASHERS
BUSHING
LIFT MECHANISM LINK
WASHERS
NUT
CABLE
CABLE BALL
CABLE HOOK
WASHER
ATTACHMENT NUT
WASHER (4)
EXTERIOR HANDLE WELL
NUT(4)
BOLT
WASHER
LATCH HANDLE LEVER BRACKET
LATCH HANDLE LEVER
BUSHING
WASHER
NUT
NUT
WASHER
HANDLE INTERLOCK PIN
BOLT (4)
SCREW
HANDLE INTERLOCK PIN BUSHING RETAINER CLIP
LIFT MECHANISM HOUSING
WASHER
NUT
ECCENTRIC LOCK PIN
ECCENTRIC ADJUSTMENT WASHER
EXTERNAL HANDLE LINK
BOLT (4)
C'SINK WASHER (4)
NUT (4)
WASHER
BOLT
WASHER
BEARING
F PLI WASHER (4)
WASHER
NUT
WASHER
BOLT
WASHER
WASHER
BEARING
G
QUADRANT
INTERIOR HANDLE HOUSING
LIFT MECHANISM HOUSING
22.02.52.083-1A


G
F
EXPLODED
UNLOADED
LOADED
PLI WASHER (4) ENTRANCE DOORS ONLY, STANDARD AN WASHERS ARE USED ON THE SERVICE DOORS
22.02.52.083-2
G
NUT (5)
WASHER (5)
SCREW (3)
H
SPIDER
PULLEY
RACE
SCREW (5)
WASHER (3)
NUT (3)
H
LEGEND
* SCREW
● NUT

(7) Remove one screw and four bolts attaching lift-mechanism housing to exterior handle well. Exterior door handle cam and shims will fall free at this time.

(8) Remove four bolts attaching lift-mechanism housing to door structure and discard PLI washers; PLI washers will be found on the main entrance doors only; standard AN washers are used on the service doors.

NOTE: Once a bolt is tightened using PLI washers, the used PLI WASHER must be replaced; refer to Chapter 13, STANDARD PRACTICES - AIRFRAME, for PLI washer installation.

(9) Remove quadrant and lift-mechanism housing from door assembly.

(10) Remove quadrant from lift-mechanism housing as follows:

(a) Remove bolt attaching the eccentric lock-pin assembly and the eccentric adjustment washer.

(b) Remove bolt, and remove quadrant from lift-mechanism housing.

(c) Remove screws attaching spider and race to pulley.

C. Install Quadrant.

(1) Install quadrant in lift mechanism as follows:

(a) Install spider and race to pulley and apply corrosion preventive (Specification MIL-C-16173A, Grade 1) to faying surfaces.

(b) Install quadrant in lift-mechanism housing.

(c) Torque nut to 300 inch-pounds.

(d) Install the spider eccentric adjustment washer and the eccentric lock-pin assembly in the neutral position on the external handle link.

(2) Place quadrant and lift-mechanism housing in door assembly.

(3) Install lift-mechanism housing to door structure, using countersunk washers under bolt heads, PLI washers under nuts on main entrance doors, and standard AN washers under nuts on service doors.

(4) Install lift-mechanism housing to exterior handle well, apply EC 1293 sealer, or equivalent, to faying surfaces; install exterior door handle shims, and cam using one screw and four bolts.

(5) Install latch handle lever to bracket on left-mechanism housing.

NOTE: Prior to installation of cables on quadrant, ensure cables are properly routed in door hinge area.

(6) Install cable ends to quadrant and install hooks in hook slots.

(7) Adjust door operating cables; refer to Adjustment/Test Section for applicable door.

(8) Lockwire cable hooks in hook slots of quadrant.

(9) With the interior control handle in the open position, connect lower end of entrance door springs to door lift mechanism link, making sure bushing is installed in door lift mechanism.

(10) With the interior door control handle in the open position, check for clearance between lower surface of door control plate and top of bolt retainers in bottom of slide tube well.

(11) Remove wood block between upper door hinge and hinge skin cutout.

(12) Install exterior door handle and shaft; refer to Paragraph 8.

(13) Replace the soundproofing and door interior trim; refer to Chapter 25, EQUIPMENT/FURNISHINGS.

2. Removal/Installation Forward Main Entrance Door Interlock Mechanism (see Figure 402)

A. Equipment Required - None.

B. Remove Interlock Mechanism.

WARNING: ENSURE AGAINST DOOR HANDLE BEING MOVED INADVERTENTLY. IF HANDLE IS NOT HELD AS IT MOVES OVER CENTER, IT IS DANGEROUS AS THE COUNTERBALANCE SPRING MOVES THE HANDLE WITH A FORCE IN EXCESS OF 70 POUNDS.

NOTE: Bag and tag all loose hardware for ease of reinstallation.

(1) Remove necessary door interior trim and soundproofing to gain access to the door interior; refer to Chapter 25, EQUIPMENT/FURNISHINGS.

(2) Remove nut and washer attaching handle latch push-pull rod to upper bell crank.

(3) Remove nut and washer attaching interlock pin push-pull rod to upper bell crank.

(4) Remove cotter key, washer, and pin from upper mounting bracket and bell crank.

(5) Remove cotter key, washer, and pin from lower mounting bracket and bell crank.

(6) Remove interlock mechanism.

C. Install Interlock Mechanism.

(1) Position interlock mechanism in door for installation.

(2) Install lower bell crank to mounting bracket, using pin, washer, and cotter key.

(3) Install upper bell crank to mounting bracket, using pin, washer, and cotter key.

(4) Install interlock pin push-pull rod to upper bell crank, using washer and nut.

(5) Install handle latch push-pull rod to upper bell crank, using washer and nut.

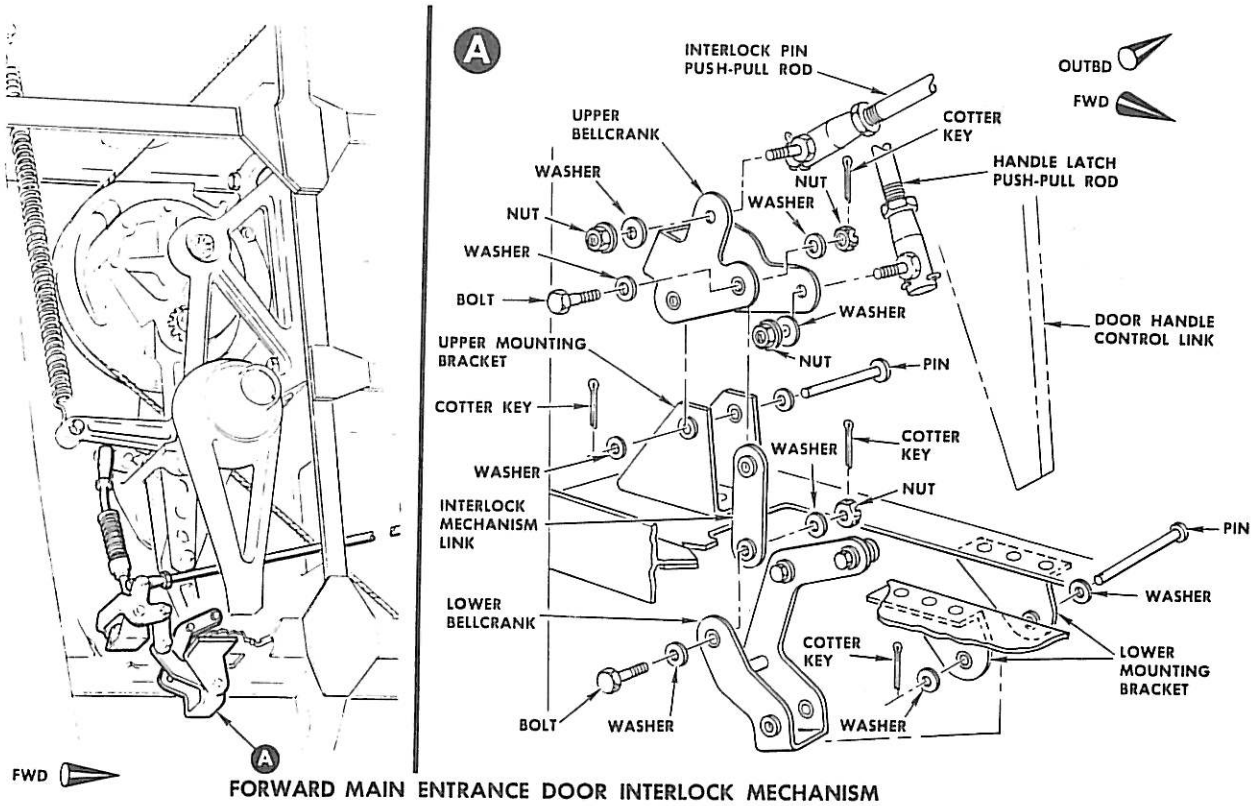
(6) Install interlock mechanism link to upper and lower bell cranks.

3. Removal/Installation Rear Main Entrance and Service Door Interlock Mechanism (see Figure 402)

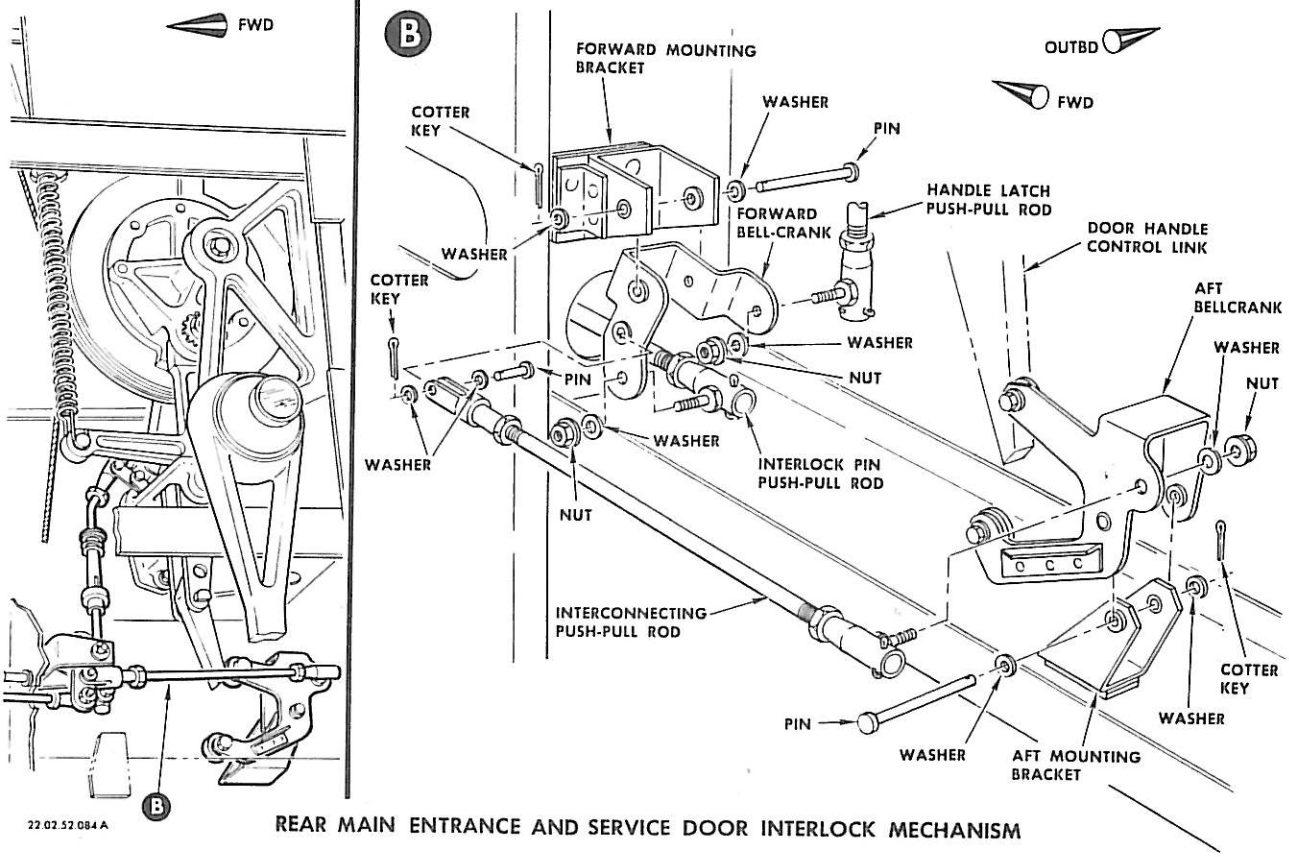
A. Equipment Required - None.

B. Remove Interlock Mechanism.

NOTE: Removal/Installation procedure given here for rear main entrance and service doors is similar to that for forward service door; however, the interlock mechanism geometry differs.



FORWARD MAIN ENTRANCE DOOR INTERLOCK MECHANISM



REAR MAIN ENTRANCE AND SERVICE DOOR INTERLOCK MECHANISM

(1) Remove necessary door interior trim and soundproofing to gain acce to the door interior; refer to Chapter 25, EQUIPMENT/FURNISHINGS.

(2) Remove interconnecting push-pull rod between forward and aft bell cranks.

(3) Remove cotter key, washer, and pin from aft mounting bracket and bell crank, remove bell crank.

(4) Remove nut and washer attaching handle latch push-pull rod to forward bell crank.

(5) Remove nut and washer attaching interlock pin push-pull rod to forward bell crank.

(6) Remove cotter key, washer, and pin from forward mounting bracket and bell crank.

C. Install Interlock Mechanism.

(1) Install forward bell crank to mounting bracket, using pin, washer, and cotter key.

(2) Install interlock pin push-pull rod to forward bell crank, using washer and nut.

(3) Install handle latch push-pull rod to forward bell crank, using washer and nut.

(4) Install aft bell crank to mounting bracket, using pin, washer, and cotter key.

(5) Install interconnecting push-pull rod between forward and aft bell cranks, using washer and nut on aft end, and pin, washers, and cotter key on forward end.

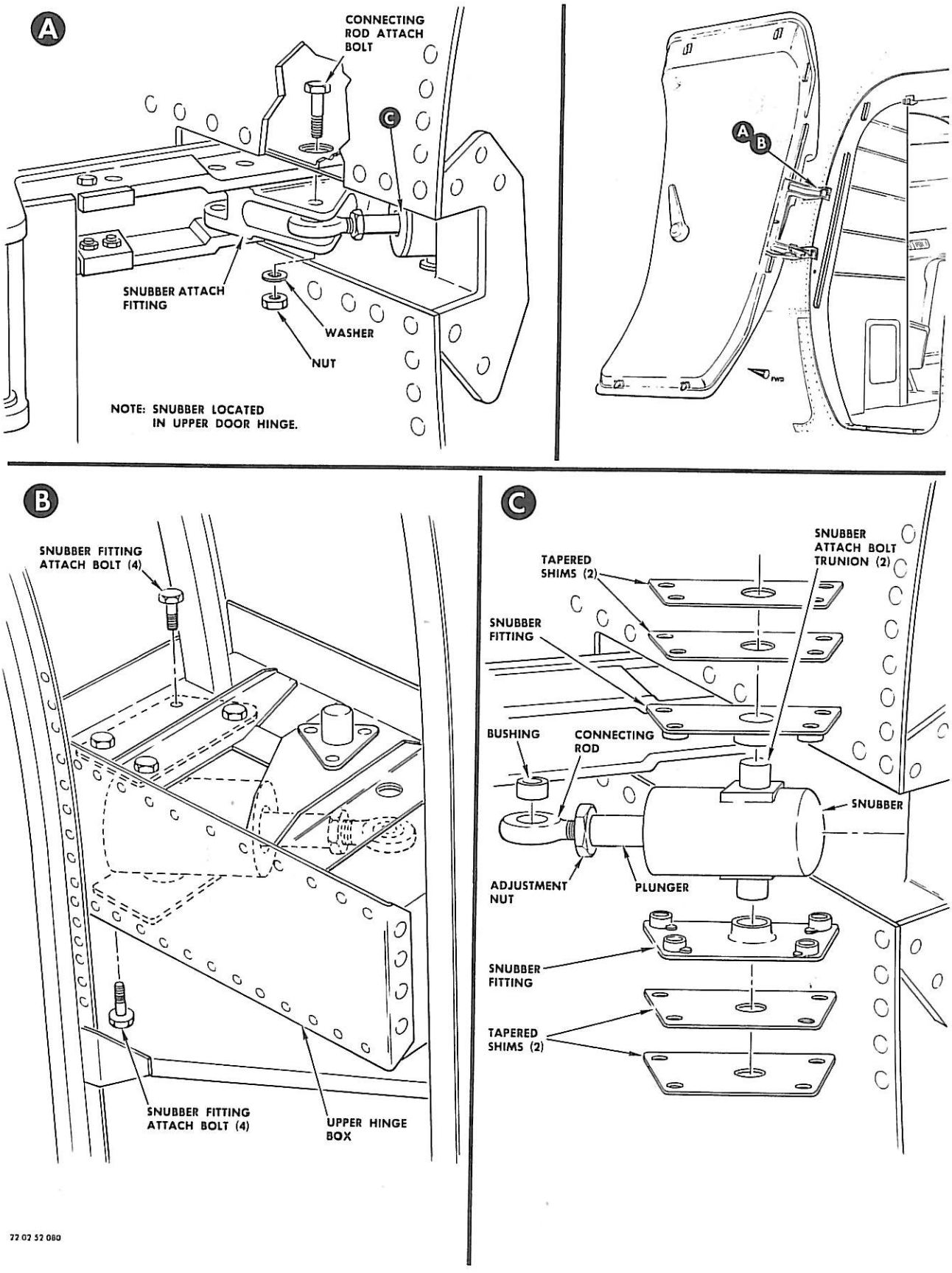
4. Removal/Installation Main Entrance and Service Door Snubber (see Figure 403)

NOTE: The replacement procedures for the main entrance and service door snubbers are similar; therefore, the following procedure is applicable for all these doors.

A. Equipment Required - None.

WARNING: ENSURE AGAINST DOOR HANDLE BEING MOVED INADVERTENTLY. IF HANDLE IS NOT HELD AS IT MOVES OVER CENTER, IT IS DANGEROUS AS THE COUNTERBALANCE SPRING MOVES THE HANDLE WITH A FORCE IN EXCESS OF 70 POUNDS.

NOTE: Bag and tag all loose hardware for ease of reinstallation.


A
CONNECTING ROD ATTACH BOLT
C
SNUBBER ATTACH FITTING
WASHER
NUT
NOTE: SNUBBER LOCATED IN UPPER DOOR HINGE.
A
B
B
SNUBBER FITTING ATTACH BOLT (4)
SNUBBER FITTING ATTACH BOLT (4)
UPPER HINGE BOX
C
SNUBBER ATTACH BOLT TRUNION (2)
TAPERED SHIMS (2)
SNUBBER FITTING
BUSHING
CONNECTING ROD
SNUBBER
ADJUSTMENT NUT
PLUNGER
SNUBBER FITTING
TAPERED SHIMS (2)
72 02 52 080

B. Preparation.

(1) If forward main entrance door snubber is to be removed, remove necessary interior trim and soundproofing; refer to Chapter 25, EQUIPMENT/FURNISHINGS.

(2) If forward or aft service door snubber is to be removed, remove access door on interior trim and remove soundproofing; refer to Chapter 25, EQUIPMENT/FURNISHINGS.

(3) If rear main entrance door snubber is to be removed, proceed as follows:

(a) Open outboard buffet compartment doors above the evacuation slide compartment door; remove outboard access doors located in these buffet compartments.

(b) Remove access doors on interior trim outboard of buffet and remove soundproofing; refer to Chapter 25, EQUIPMENT/FURNISHINGS.

C. Remove Door Snubber.

NOTE: Bag and tag all loose hardware for ease of reinstallation.

(1) Open door about 45 degrees to remove bolt in connecting rod end of door snubber; bolt head must align with hole in upper surface of hinge box for removal. Remove bolt and bushing.

(2) Identify (by edge marks or other means) tapered shims between fittings and hinge box in relation to their location and position in the hinge stack, then remove four bolts attaching upper snubber fitting and four bolts attaching lower snubber fitting to hinge box.

CAUTION: TAPERED SHIMS MUST BE REINSTALLED IN THEIR ORIGINAL LOCATION AND POSITION TO PREVENT SNUBBER FROM BINDING, RESULTING IN DAMAGE TO SNUBBER.

(3) Remove snubber fittings and tapered shims.

D. Install Door Snubber.

(1) Place lower tapered shims previously identified, in position in hinge box; position snubber between fittings and position in hinge box.

(2) Install lower fitting attach bolts; do not tighten at this time.

(3) Place upper shims in position and install upper fitting attach bolts.

(4) Tighten lower fitting attach bolts.

(5) Position door in approximately the 45-degree open position, and install bushing and bolt in connecting rod end of door snubber. Loosen jam nut on snubber piston shaft and rotate shaft to lengthen. While moving door gently back and forth across the midpoint of hinge travel, continue lengthening until snubber piston is felt to bottom with piston in. When this point is determined, shorten snubber piston shaft by rotating it one full turn; re-tighten jam nut.

NOTE: Infinitely fine adjustment is possible by rotating the piston shaft within the snubber without removing the attach bolt; 0.50 wrench pads are provided on the piston shaft.

(6) Slowly rotate door to fully open and fully closed positions to determine that door snubber piston is not bottoming at extremes of travel. If proper snubber operation is questionable, check snubber as follows: Disconnect snubber piston rod end from door hinge. With snubber piston retracted, apply a constant 51 pound pull to piston rod end with spring scale and record time for piston to travel from fully retracted to fully extended position. Piston travel time should be a minimum of 12 seconds and a maximum of 50 seconds. Permanently install bushing and bolt in connecting rod end of snubber and tighten securely. Safety-wire jam nut on snubbers that have provision for such.

(7) Restore airplane to normal configuration; refer to item B.

5. Removal/Installation Main Entrance and Service Door Hold-Open Mechanism (see Figure 404)

NOTE: The replacement procedures for the main entrance and service door hold-open mechanism are similar; therefore, the following procedure is applicable for all these doors.

A. Equipment Required - None.

B. Remove Door Hold-Open Mechanism.

NOTE: Bag and tag all loose hardware for ease of reinstallation.

(1) Open door to full open position.

(2) Remove bolt and bushing from inner and outer stop linkage.

(3) Remove hold-open hook pivot bolt.

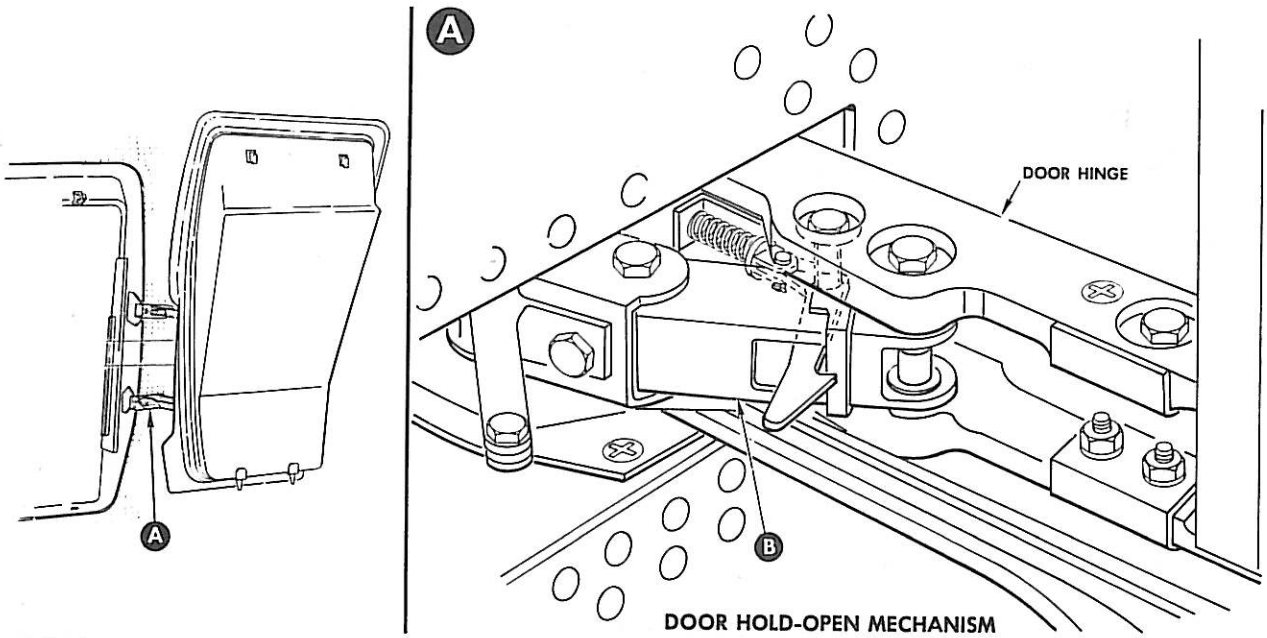
(4) Remove cotter key, washer, and clevis pin from end of hold-open hook actuator pin.

(5) Remove hold-open mechanism, hold-open actuator pin and spring, and hold-open hook from door hinge.

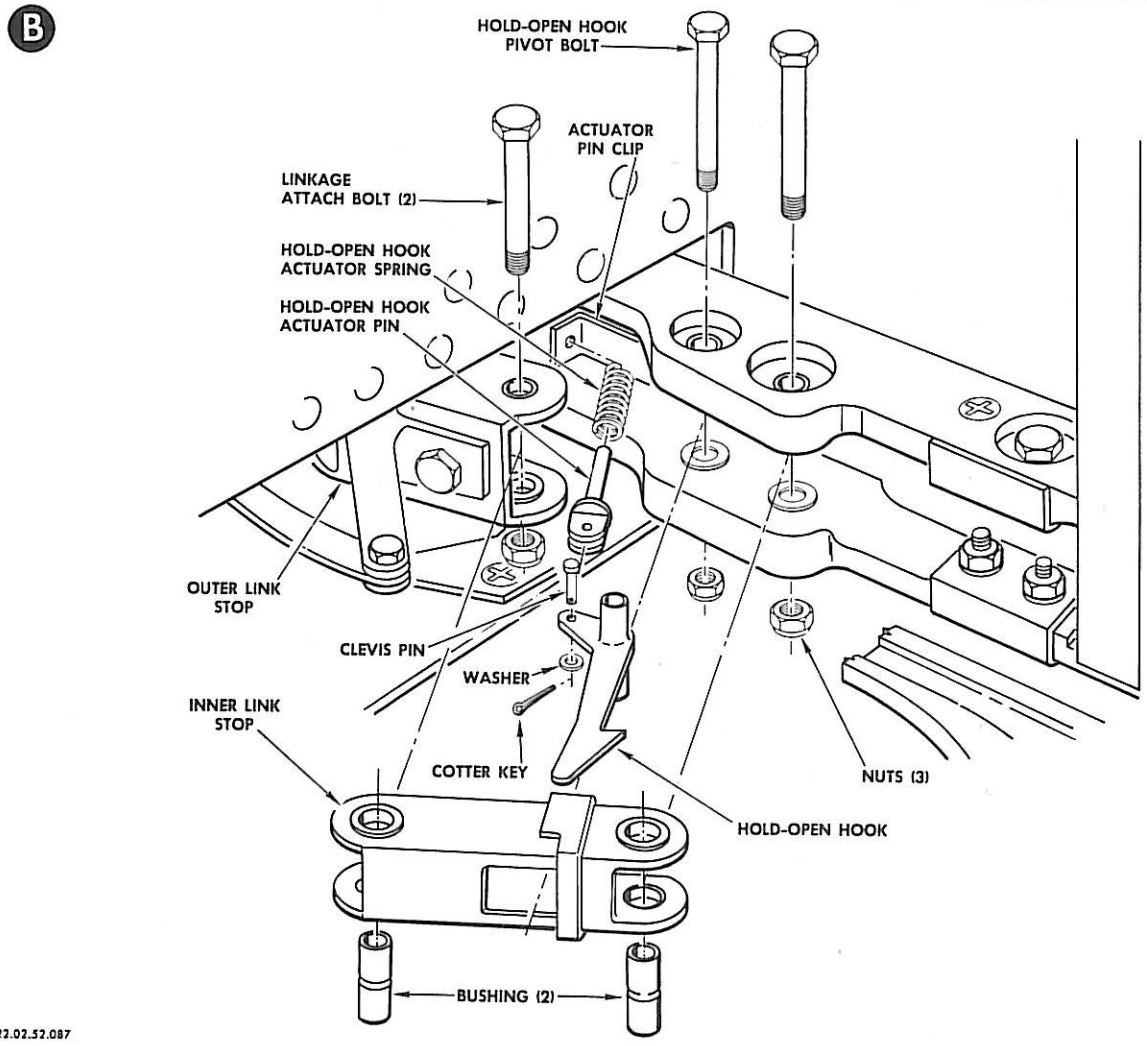
C. Install Door Hold-Open Mechanism.

(1) Place hold-open spring and actuator pin in position, by inserting end of actuator pin in clip inside of hinge box.

(2) Insert hold-open hook through cutout in inner stop link, place hold-open mechanism in door hinge.



DOOR HOLD-OPEN MECHANISM



22.02.52.087

Main Entrance and Service Door Hold-Open Mechanism Installation
Figure 404

(3) Install clevis pin, washer, and cotter key to clevis end of hold-open actuator pin and hold-open hook, install hold-open hook pivot bolt.

(4) Install bushing and bolt in outer and inner stop linkage.

6. Removal/Installation Main Entrance and Service Door Control Cable

NOTE: For the door control cable removal/installation procedure, follow the door hinge removal/installation procedure for the particular door, in which the control cable is to be removed or installed, with the following exceptions.

A. Equipment Required:

(1) Torque wrench calibrated in inch-pounds.

(2) EC 1293 sealer, 3M Co., St. Paul 6, Minn., or equivalent.

(3) Aliphatic naphtha, Federal Specification TT-N-95a.

(4) Grease, Specification MIL-G-7421.

B. Remove Door Control Cable.

WARNING: ENSURE AGAINST DOOR HANDLE BEING MOVED INADVERTENTLY. IF HANDLE IS NOT HELD AS IT MOVES OVER CENTER, IT IS DANGEROUS AS THE COUNTERBALANCE SPRING MOVES THE HANDLE WITH A FORCE IN EXCESS OF 70 POUNDS.

NOTE: Bag and tag all loose hardware for ease of reinstallation.

(1) Remove door hinge of particular door from which cable is to be removed; refer to door hinge removal/installation of particular door.

NOTE: There are no plugs in the main entrance door slide tube as both ends of the slide tube are in the pressurized areas of these doors. Upon completion of door hinge removal, to the point of actually removing the assembly from the door, the control cable pressure seals must be removed from the feed thru fittings before cable ball ends can be pulled through to remove cable; refer to applicable door hinge removal/installation of particular door.

C. Install Door Control Cable.

(1) Position cable through pulley brackets for installation of pulleys.

NOTE: Ensure that the longest section of cable, measured from the midpoint ball, routes through the upper cable pulley.

(2) Install cable by following the procedure given in the removal/installation procedure for door hinge of the particular door.

(3) When door hinge installation is completed, install cable feedthru seals.

(4) Adjust the upper and lower portions of the operating cable as directed in adjustment/test procedure for the particular door.

(5) Install door interior trim and necessary soundproofing; refer to Chapter 25, EQUIPMENT/FURNISHINGS.

(6) Install door interior control handle; refer to Paragraph 8.

(7) Install door assembly; refer to removal/installation door assembly of the particular door.

(8) Using spring scale, check door handle operating loads. Handle loads shall not exceed 70 pounds with trim installed.

7. Removal/Installation Main Entrance and Service Door Control Cable Pulley (see Figure 405)

NOTE: The replacement procedures for the main entrance and service door control cable pulleys are similar; therefore, one replacement procedure is given here, and is applicable for all these doors.

A. Equipment Required - Calibrated cable tensiometer capable of measuring tension loads of 270 to 770 pounds.

B. Remove Cable Pulley.

WARNING: ENSURE AGAINST DOOR HANDLE BEING MOVED INADVERTENTLY. IF HANDLE IS NOT HELD AS IT MOVES OVER CENTER, IT IS DANGEROUS AS THE COUNTERBALANCE SPRING MOVES THE HANDLE WITH A FORCE IN EXCESS OF 70 POUNDS.

NOTE: Bag and tag all loose hardware for ease of reinstallation.

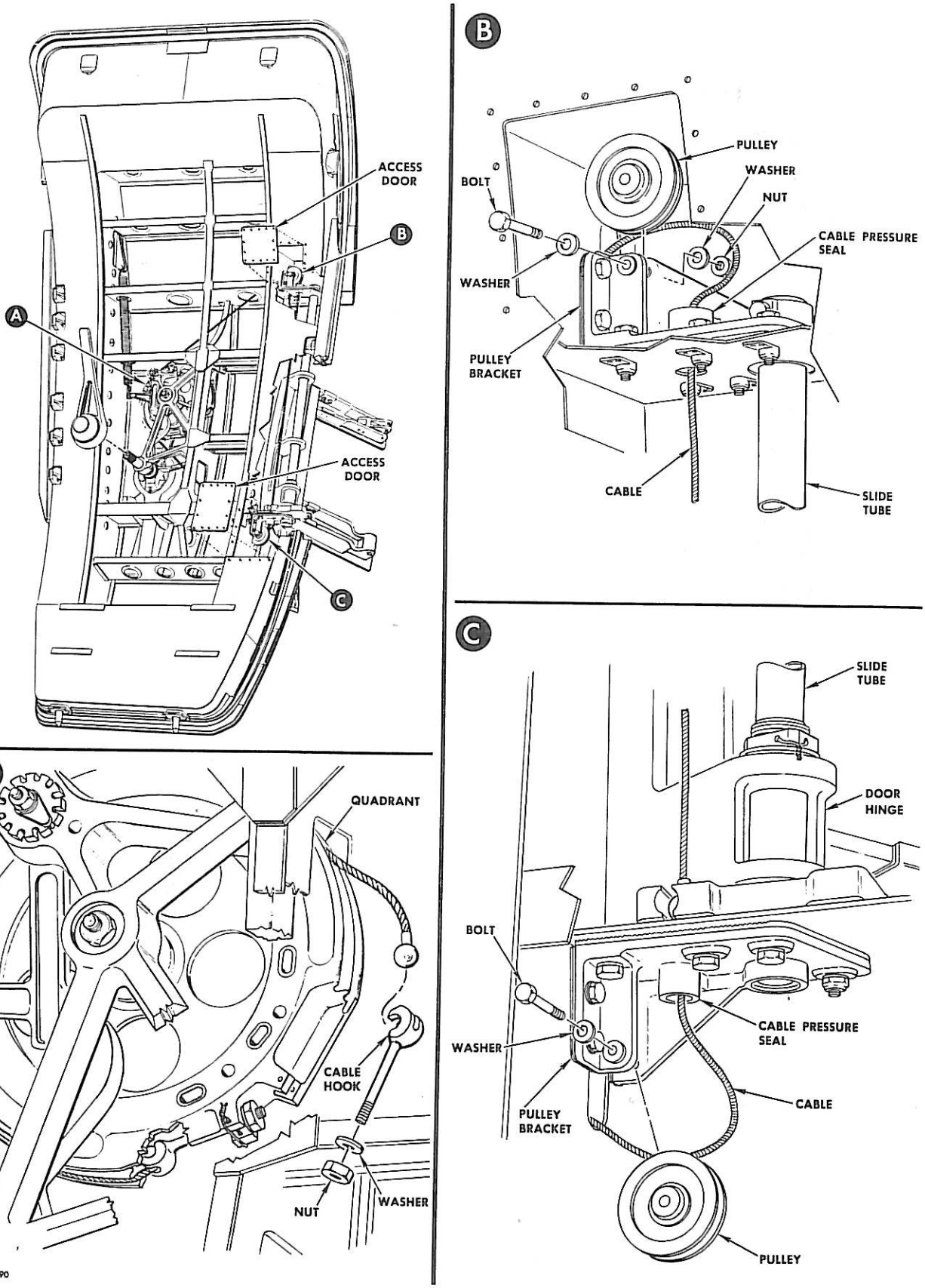
(1) Remove necessary door interior trim and soundproofing to gain access to the door interior, refer to Chapter 25, EQUIPMENT/FURNISHINGS.

(2) Remove access door at pulley location.

(3) Loosen nuts on cable hooks at the cable quadrant and disconnect cables.

NOTE: Cable guards are incorporated on the rear service door pulleys only.

(4) Remove nut, washers, and bolt attaching lower pulley and cable guard to bracket; remove nut, washers, and bolt attaching upper pulley and cable guard to bracket.



Main Entrance and Service Door Cable Pulley Installation
Figure 405

C. Install Cable Pulley.

(1) Install lower pulley and cable guard to bracket, using bolt, washers, and nut; install upper pulley in same fashion.

(2) Install cable to quadrant; refer to Removal/Installation Main Entrance and Service Door Control Cable.

(3) Install access door.

(4) Replace soundproofing and door interior trim; refer to Chapter 25, EQUIPMENT/FURNISHINGS.

8. Removal/Installation Main Entrance and Service Doors Interior and Exterior Handles (see Figure 406)

A. Equipment Required. Grease, Specification MIL-G-7118A.

B. Preparation.

The door interior and exterior handles may be removed separately. The preparation procedure below must be accomplished before removing either handle. Bag and tag all loose hardware for ease of reinstallation.

WARNING: ENSURE AGAINST DOOR HANDLE BEING MOVED INADVERTENTLY. IF HANDLE IS ALLOWED TO MOVE FREELY BY COUNTERBALANCE SPRING FORCE, THE MOVING HANDLE MAY CAUSE SERIOUS INJURY TO PERSONNEL.

C. Remove Door Interior Handle.

(1) Remove insignia lens, insignia insert, insignia backup disc, and spacer from the insignia housing of the door interior handle by removing the attaching lock ring.

(2) Remove the insignia housing from the door handle shaft by removing safety wire and the attaching retainer bolt and washer.

WARNING: EXERCISE CARE, WHEN REMOVING INSIGNIA HOUSING RETAINER BOLT, TO PREVENT INSIGNIA HOUSING FROM BEING EJECTED BY THE LARGE COIL SPRING.

(3) Working through the opening created by the removal of the insignia housing, remove the thrust ring, washer, two coil springs, and the interior handle hub shaft driver.

(4) Remove the interior handle and the stop ring assembly from the handle hub shaft by removing the four attaching bolts.

D. Remove Door Exterior Handle.

(1) Remove lock ring from door interior handle insignia housing.

(2) Remove insignia lens, insignia insert, insignia backup disc, and spacer.

CONVAIR MODEL 30

MAINTENANCE MANUAL

TEMPORARY REVISION NO. 52-4.

Insert facing 52-1-0, Page 416, dated Nov. 1/62 (or subsequent).

The instructions in this temporary revision are to be used for airplanes not modified by Service Bulletin No. 52-6.

For airplanes modified by Service Bulletin No. 52-6, use the instructions on 52-1-0, Page 416, paragraph 8.

Retain this temporary revision in your manual until Service Bulletin No. 52-6 has been accomplished on all applicable airplanes.

8. Removal/Installation Main Entrance and Service Doors Interior and Exterior Handles (see Figure 406)

A. Equipment Required. Grease, Specification MIL-G-7118A.

B. Preparation.

The door interior and exterior handles may be removed separately. The preparation procedure below must be accomplished before removing either handle. Bag and tag all loose hardware for ease of reinstallation.

WARNING: ENSURE AGAINST DOOR HANDLE BEING MOVED INADVERTENTLY. IF HANDLE IS ALLOWED TO MOVE FREELY BY COUNTERBALANCE SPRING FORCE, THE MOVING HANDLE MAY CAUSE SERIOUS INJURY TO PERSONNEL.

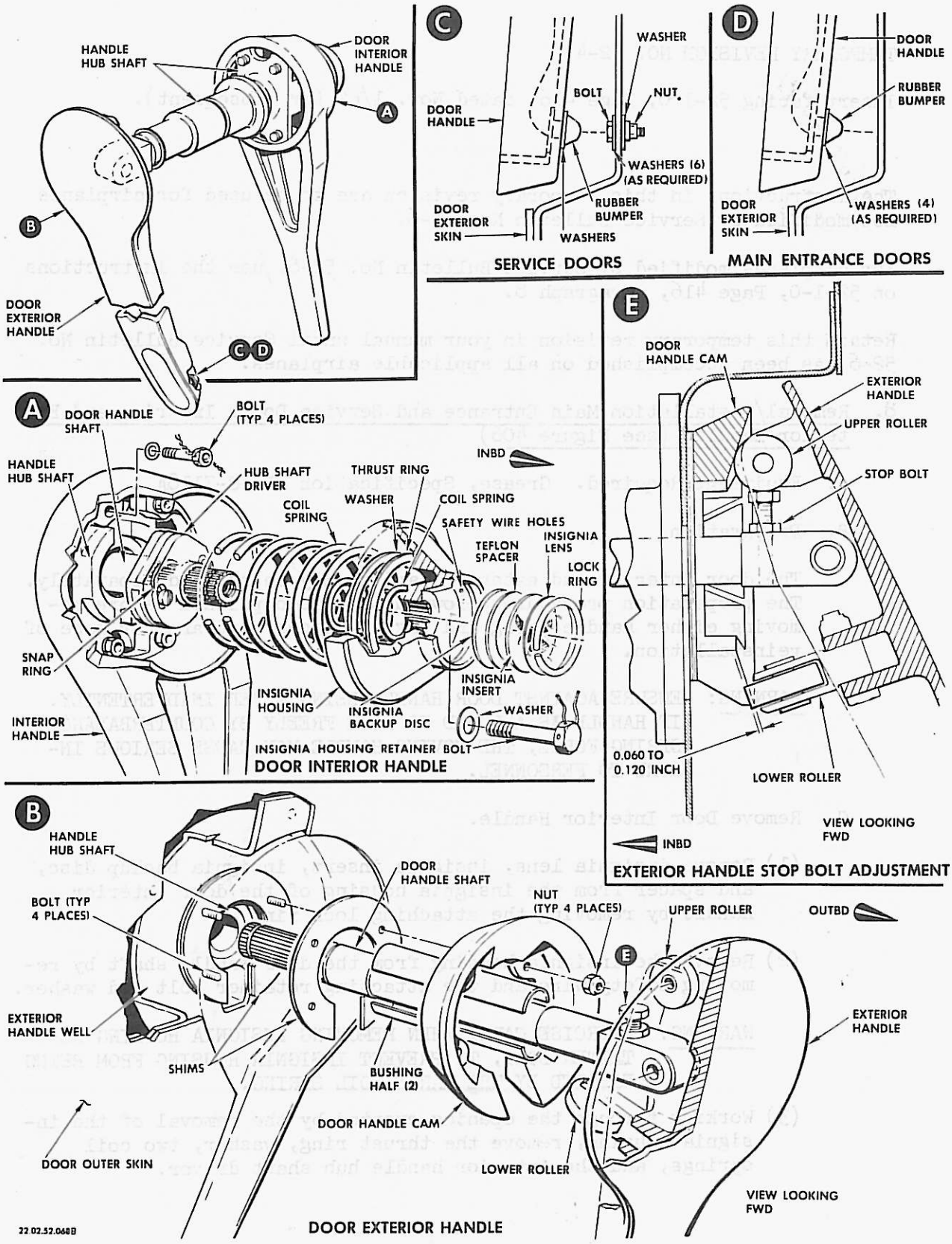
C. Remove Door Interior Handle.

(1) Remove insignia lens, insignia insert, insignia backup disc, and spacer from the insignia housing of the door interior handle by removing the attaching lock ring.

(2) Remove the insignia housing from the door handle shaft by removing safety wire and the attaching retainer bolt and washer.

WARNING: EXERCISE CARE, WHEN REMOVING INSIGNIA HOUSING RETAINER BOLT, TO PREVENT INSIGNIA HOUSING FROM BEING EJECTED BY THE LARGE COIL SPRING.

(3) Working through the opening created by the removal of the insignia housing, remove the thrust ring, washer, two coil springs, and the interior handle hub shaft driver.



Main Entrance and Service Door Interior and Exterior Handle Installation
Figure 406

(4) Remove the interior handle from the handle hub shaft by removing the four attaching bolts.

D. Remove Door Exterior Handle.

(1) Remove lock ring from door interior handle insignia housing.

(2) Remove insignia lens, insignia insert, insignia backup disc, and spacer.

(3) Remove safety wire from insignia housing retainer bolt head inside of interior handle housing. Remove bolt and washer from end of door handle shaft.

WARNING: EXERCISE CARE, WHEN REMOVING INSIGNIA HOUSING RETAINER BOLT, TO PREVENT INSIGNIA HOUSING FROM BEING EJECTED BY THE LARGE COIL SPRING.

(4) Remove insignia housing, thrust ring, washer, two coil springs, and the interior handle hub shaft driver.

(5) Remove snap ring from center annular groove on door exterior handle shaft spline.

(6) Remove door exterior handle and shaft assembly and remove split bushing from shaft. Also remove door handle cam and shims.

CAUTION: EXERCISE CARE, WHEN REMOVING SHAFT, TO PREVENT SPLIT BUSHING DROPPING FROM SHAFT.

E. Install Door Exterior Handle.

(1) Temporarily position the exterior door handle, door handle shaft, door handle cam, and two shims in position in the door. Hold in place and check that the door handle is flush with the door exterior skin surface. If adjustment is required, proceed as follows:

(a) Remove the exterior door handle, door handle shaft, and door handle cam; remove or add shims as required.

(b) On main entrance doors, if lower end of door handle is not flush with the door exterior skin surface, remove or add washers as required under door handle rubber bumper. On service doors, if lower end of door handle is not flush with the door exterior skin surface, remove or add washers as required under head of rubber bumper stop bolt in door handle well.

(2) With the exterior handle removed from the door, adjust stop bolt located on the door handle shaft in the exterior handle well. Adjust the stop bolt so that the handle upper roller will contact the stop bolt when the handle lower roller is 0.060 to 0.120 inch below the surface of the door handle cam.

(3) Lubricate the bearing surfaces of the exterior door handle shaft with grease; MIL-G-7118A.

(4) Position shims and cam over bolts at door opening and install four nuts.

(5) Install split bushing on exterior handle shaft and insert shaft in door.

(6) Install snap ring in center annular groove on door exterior handle shaft spline.

(7) Slide the hub shaft driver over the exterior handle shaft.

(8) Position the outer coil spring against the handle hub shaft; position the inner coil spring against the hub shaft driver.

(9) Place the thrust ring and washer in recess around the inner surface of the insignia housing.

(10) Slide the insignia housing assembly over the door handle shaft. Secure the insignia housing to the handle shaft with the insignia housing retainer bolt and washer. Safety wire bolt head to drilled holes in handle housing.

(11) Install teflon spacer, insignia backup disc, insignia insert, insignia lens, and lock ring in interior handle insignia housing.

F. Install Door Interior Handle.

(1) Position the interior handle on the handle hub shaft and install four bolts.

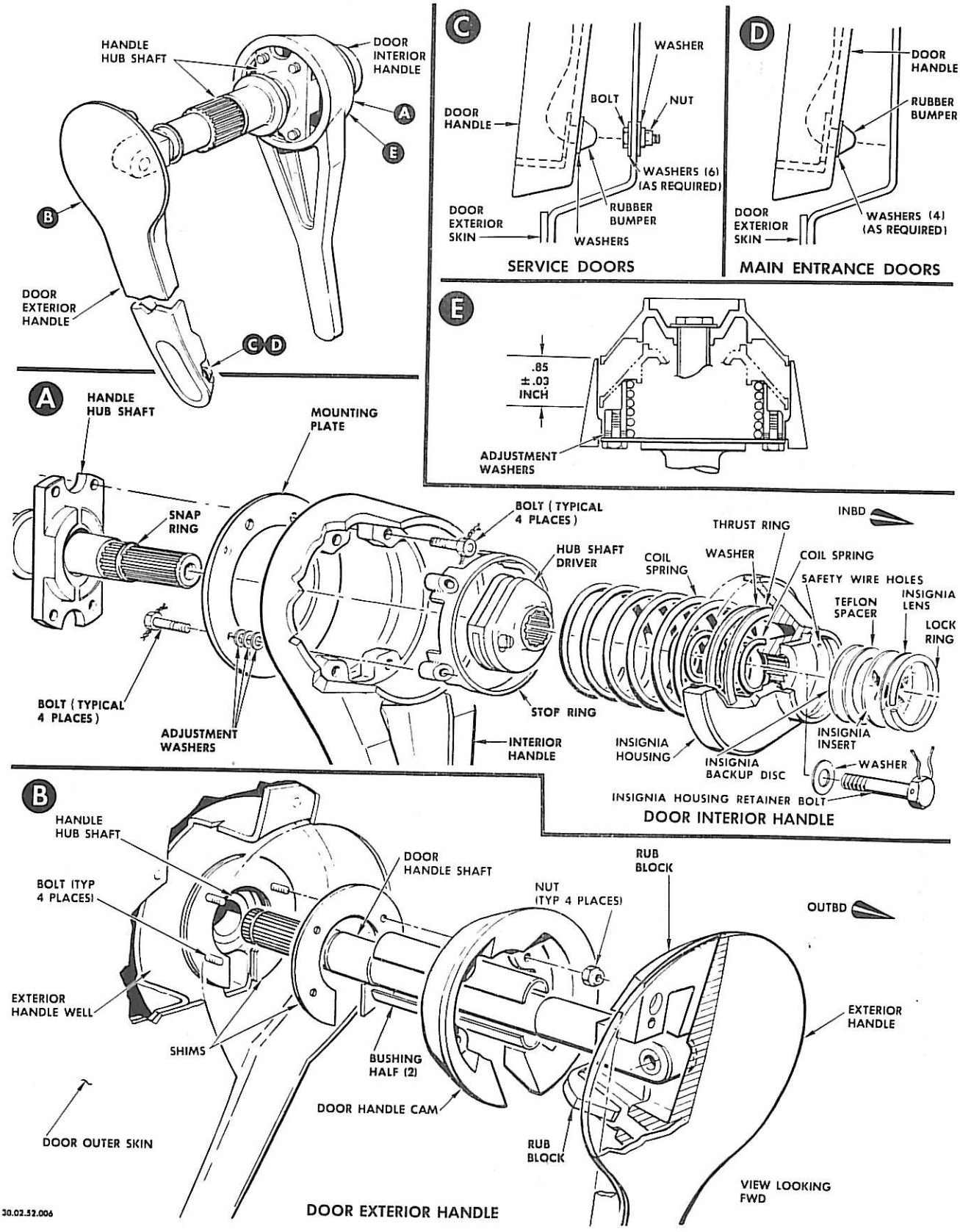
(2) Slide the hub shaft driver over the exterior handle shaft.

(3) Position the outer coil spring against the handle hub shaft; position the inner coil spring against the hub shaft driver.

(4) Place the thrust ring and washer in recess around the inner surface of the insignia housing.

(5) Slide the insignia housing assembly over the door handle shaft. Secure the insignia housing to the handle shaft with the insignia housing retainer bolt and washer. Safety wire bolt head to drilled holes in handle housing.

(6) Install teflon spacer, insignia backup disc, insignia insert, insignia lens, and lock ring in interior handle insignia housing.



Main Entrance and Service Door
Interior and Exterior Handle Installation
Figure 406

(3) Remove safety wire from insignia housing retainer bolt head inside of interior handle housing. Remove bolt and washer from end of door handle shaft.

WARNING: EXERCISE CARE, WHEN REMOVING INSIGNIA HOUSING RETAINER BOLT, TO PREVENT INSIGNIA HOUSING FROM BEING EJECTED BY THE LARGE COIL SPRING.

(4) Remove insignia housing, thrust ring, washer, two coil springs, and the interior handle hub shaft driver.

(5) Remove snap ring from center annular groove on door exterior handle shaft spline.

(6) Remove door exterior handle and shaft assembly and remove split bushing from shaft. Also remove door handle cam and shims.

CAUTION: EXERCISE CARE, WHEN REMOVING SHAFT, TO PREVENT SPLIT BUSHING DROPPING FROM SHAFT.

E. Install Door Exterior Handle.

(1) Temporarily position exterior door handle, door handle shaft, door handle cam, and two shims in position in door. Hold in place and check that door handle is flush with door exterior skin surface. If adjustment is required, proceed as follows:

(a) Remove exterior door handle, door handle shaft, and door handle cam; remove or add shims as required.

(b) On main entrance doors, if lower end of door handle is not flush with door exterior skin surface, remove or add washers as required under door handle rubber bumper. On service doors, if lower end of door handle is not flush with door exterior skin surface, remove or add washers as required under head of rubber bumper stop bolt in door handle well.

(2) Position shims and cam over bolts at door opening and install four nuts.

(3) Lubricate bearing surfaces of exterior handle shaft with grease, Specification MIL-G-7118A.

(4) Install split bushing on exterior handle shaft and insert shaft in door.

(5) Install snap ring in center annular groove on exterior handle shaft spline.

(6) Slide hub shaft driver over exterior handle shaft.

(7) Position outer coil spring against handle hub shaft; position inner coil spring against hub shaft driver.

(8) Place thrust ring and washer in recess around inner surface of insignia housing.

(9) Slide insignia housing assembly over door handle shaft. Secure insignia housing to handle shaft with insignia housing retainer bolt and washer. Safety wire bolt head to drilled holes in handle housing.

(10) Install teflon spacer, insignia backup disc, insignia insert, insignia lens, and lock ring in interior handle insignia housing.

F. Install Door Interior Handle.

NOTE: Since some components are common to the operation of both the interior and exterior handles, a complete installation of the interior handle cannot be accomplished unless the exterior handle is installed.

(1) Position stop ring and mounting plate assembly on hub shaft with the four legs pointing inboard when door is closed.

(2) Position interior handle on hub shaft; secure stop ring assembly and interior handle to hub shaft with four bolts and safety wire.

(3) Slide hub shaft driver over exterior handle shaft.

(4) Position outer coil spring against handle hub shaft; position inner coil spring against hub shaft driver.

(5) Place thrust ring and washer in recess around inner surface of insignia housing.

(6) Slide insignia housing assembly over door handle shaft; secure housing to handle shaft with insignia housing retainer bolt and washer.

(7) Check exterior handle shaft travel when handle is moved from stowed position to a point where it rides on cam. Shaft travel should be 0.85 (±0.03) inch, as shown in detail 'E' on Figure 406. If shaft travel is correct, safety-wire insignia housing retainer bolt to drilled holes in the interior handle housing and proceed to step (8). If shaft travel adjustment is necessary, remove parts installed in steps (1) through (6). Add or remove washers between stop ring and mounting plate to give correct handle shaft travel. Repeat steps (1) through (6) and complete installation by accomplishing step (8).

(8) Install teflon spacer, insignia backup disc, insignia insert, insignia lens, and lock ring in interior handle insignia housing.

MAIN ENTRANCE AND SERVICE DOOR MECHANISMS - ADJUSTMENT/TEST

1. Adjustment/Test Main Entrance and Service Door Snubber

   A. Equipment Required - Spring scale (1 to 60) pounds to check snubber operating load.

   B. Procedure.

      (1) Disconnect snubber piston rod end from door hinge.

      (2) With snubber piston retracted, apply a constant 51 pound pull to piston rod end and measure time for piston to travel from fully retracted to fully extended position. Piston travel time shall be a minimum of 12 seconds, and a maximum of 50 seconds.

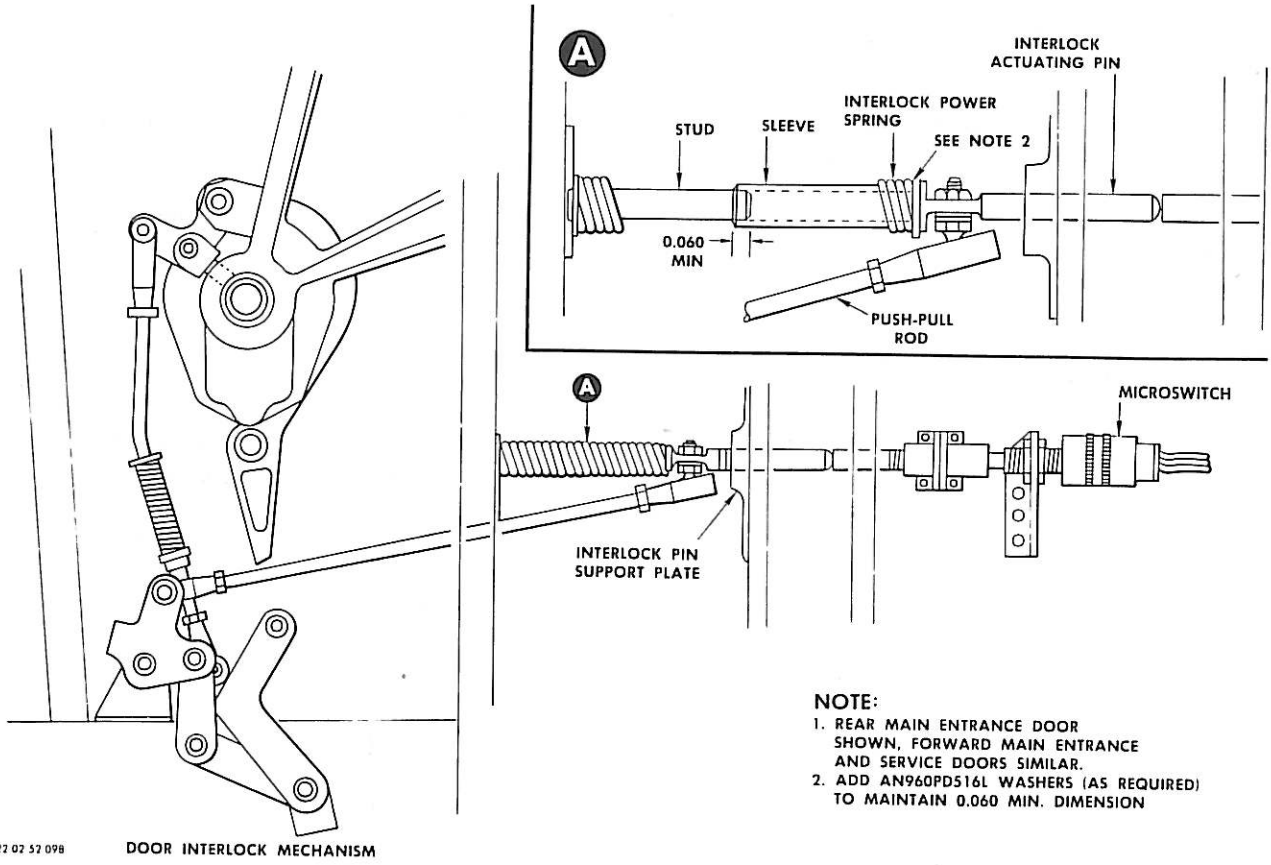
      NOTE: When installed on door, snubbing action will cease to be felt when door is 6 to 8 inches from closed position.

2. Adjustment/Test Main Entrance and Service Door Interlock Actuating Pin (see Figure 501)

   A. Equipment Required - None.

   B. Procedure.

      (1) Using AN960PD516L washers (as required) as shims between interlock power spring and head of sleeve, maintain 0.060 minimum overlap between ends of sleeve and stud.



NOTE:
1. REAR MAIN ENTRANCE DOOR SHOWN, FORWARD MAIN ENTRANCE AND SERVICE DOORS SIMILAR.
2. ADD AN960PD516L WASHERS (AS REQUIRED) TO MAINTAIN 0.060 MIN. DIMENSION

22 02 52 098 DOOR INTERLOCK MECHANISM

Main Entrance and Service Door Interlock
Actuating Pin Rigging/Adjustment
Figure 501

CABIN EXTERIOR DOORS - APPROVED REPAIRS

1. Repair Procedure - Fabrication and Installation of Interlock Pin Bushing Retainer Clip (see Figure 801)

   A. General.

   A loosened interlock pin bushing may be repaired by installing a bushing retainer clip. This bushing is located at the eleven o'clock position on the handle housing hub in the main entrance and service doors.

   B. Equipment Required.

   (1) 4130 Steel, Specification MIL-S-18729, HT TR Cond. A, 90,000 to 125,000 psi, 0.063 x 1.90 x 0.90.

   C. Procedure.

   NOTE: Bag and tag removed parts for installation.

   (1) Fabricate clip.

   (2) Remove trim panel from inside surface of door. (Refer to Chapter 25, EQUIPMENT/FURNISHINGS.)

   (3) Remove interlock pin from assembly.

   (4) Install retainer clip.

   (5) Install interlock pin.

   (6) Install trim panel. (Refer to Chapter 25, EQUIPMENT/FURNISHINGS.)

2. Replacement Procedure - Interlock Pin Ring Bushing (see Figure 802) (Applicable to airplanes modified by Service Bulletin No. 52-4.)

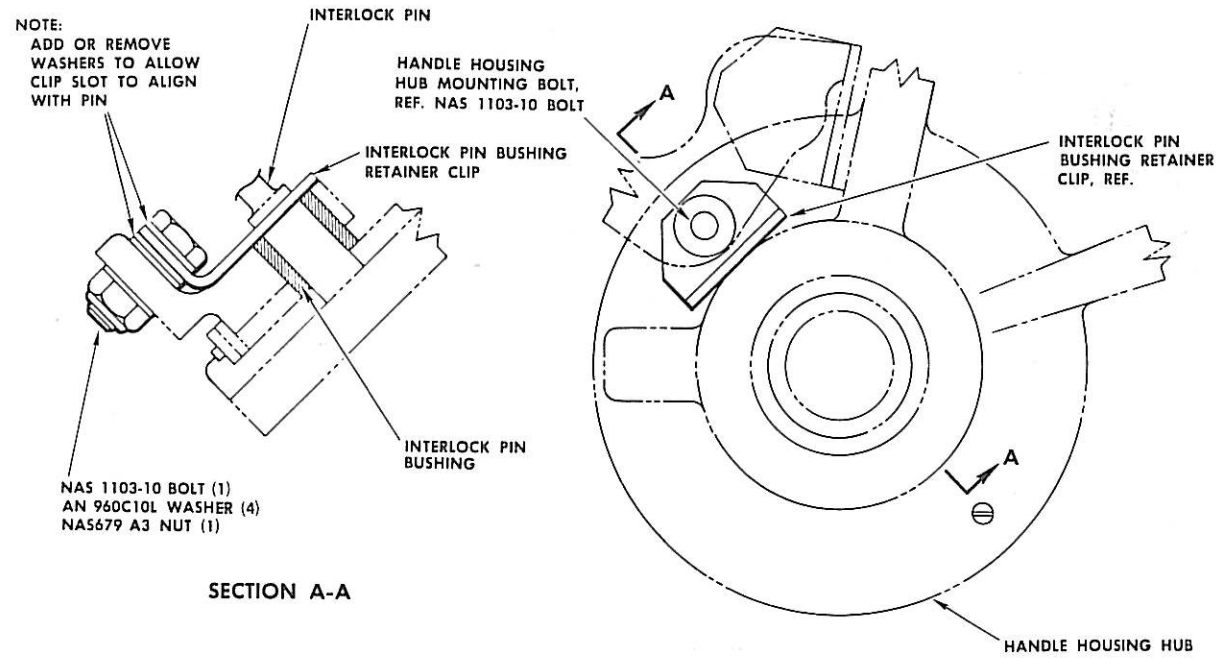
   A. General.

   The interlock pin standard bushing located at the eleven o'clock position on the handle mechanism housing may be replaced with a ring bushing to eliminate jamming of the door interlock mechanism or to preclude cracking of the handle housing hub casting. This is accomplished by machining an existing hole in the casting into a slot to provide room for the ring bushing.

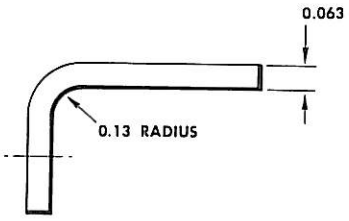
   B. Equipment Required - None.

   C. Procedure.

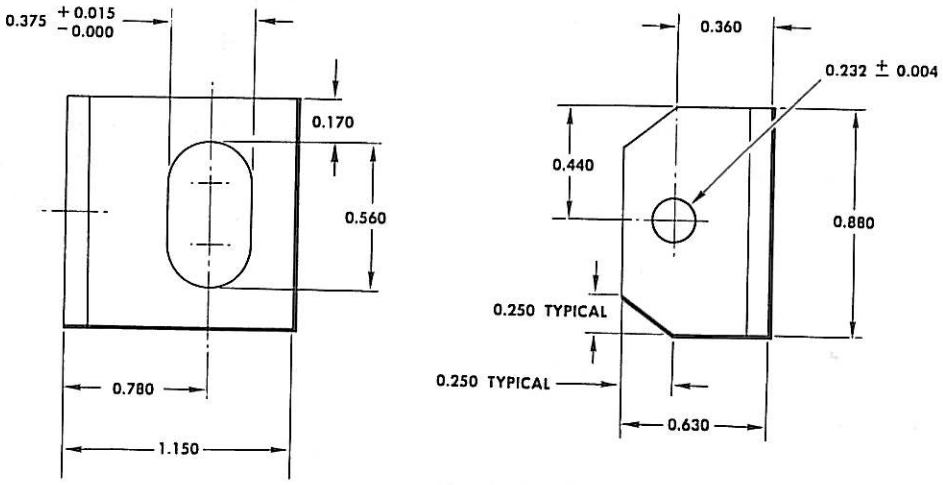
   NOTE: Bag and tag all loose hardware for ease of reinstallation.



SECTION A-A

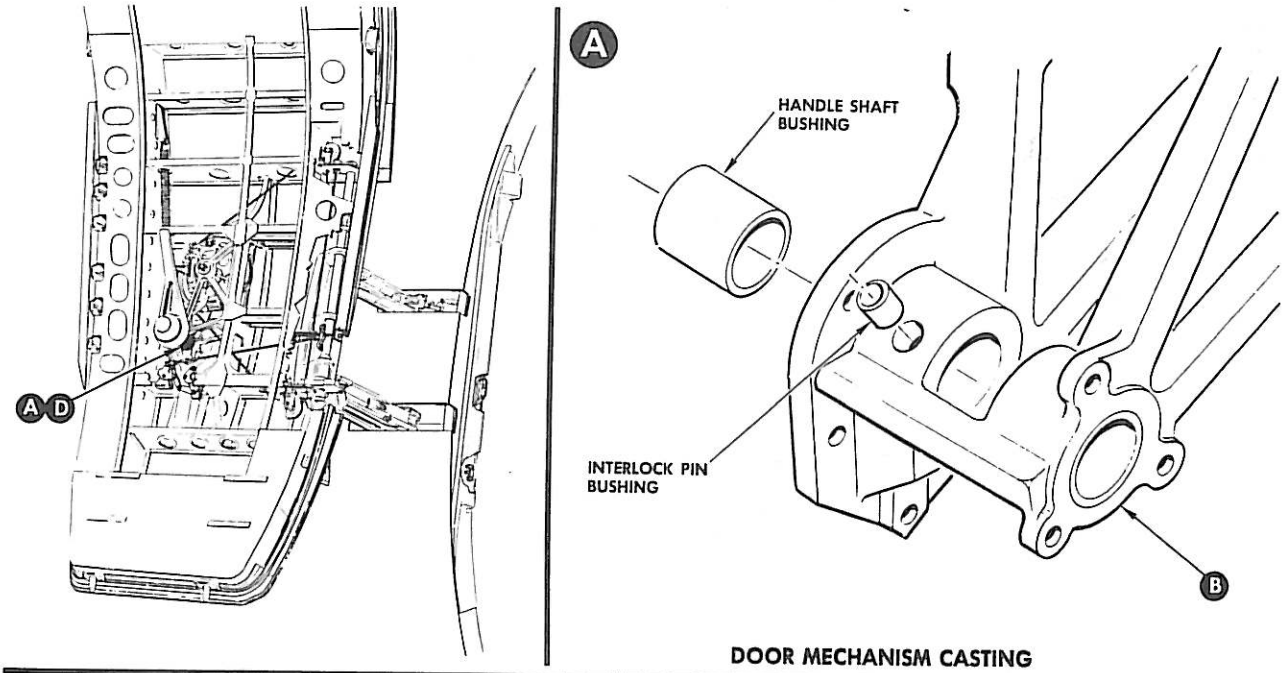


NOTE:
MAKE FROM 0.063 X 1.90 X 0.90
4130 CHROMOLY STEEL, SPECIFICATION
MIL-S-18729

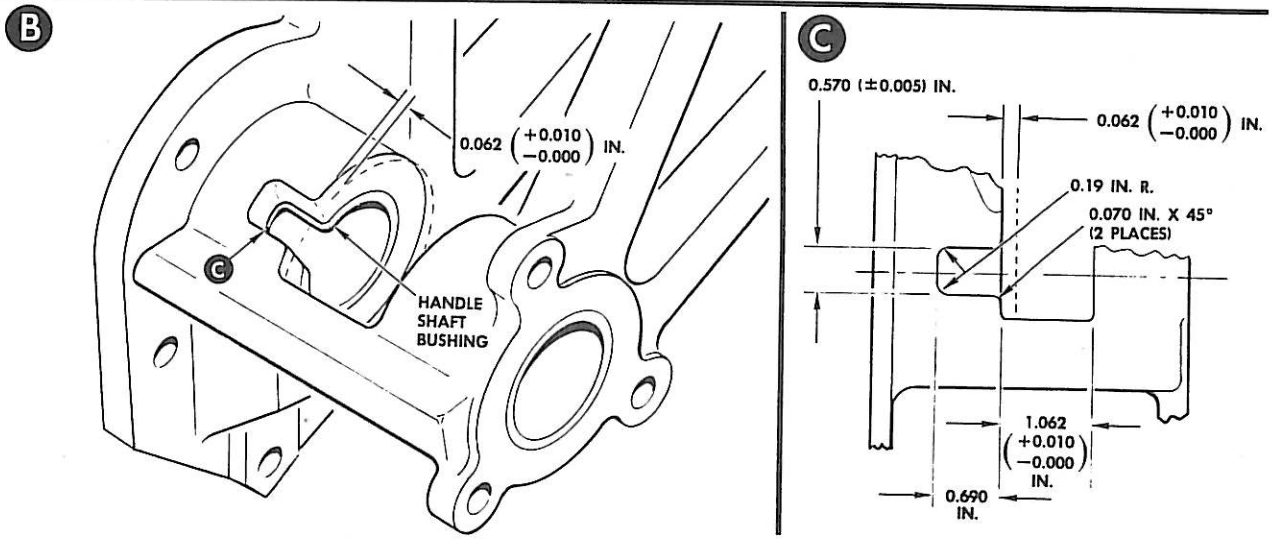


FABRICATION DETAILS FOR INTERLOCK PIN BUSHING RETAINER CLIP

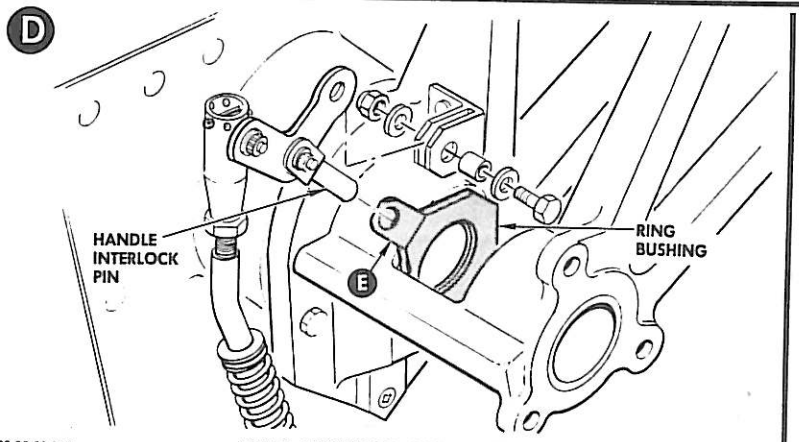
72 02 52 079A



DOOR MECHANISM CASTING

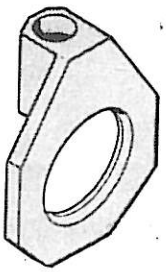


DOOR MECHANISM CASTING MACHINING DETAILS



22.02.52.104

RING BUSHING INSTALLATION



RING BUSHING

Main Entrance and Service Door Interlock Pin Ring Bushing Replacement
Figure 802

(1) Remove trim panel from inside surface of door; refer to Chapter 25, EQUIPMENT/FURNISHINGS.

(2) Remove door handle mechanism housing; refer to Removal/Installation of Main Entrance and Service Door Mechanisms.

(3) Remove interlock pin bushing and handle shaft bushing from same side of housing.

(4) Machine inner face of one-inch opening in side of housing on face nearest interlock pin hole. Remove 0.062 (+0.010, -0.000) inches material from face to allow room for ring portion of new bushing.

(5) Cut down length of handle shaft bushing by 0.060 inch or replace with new bushing of 1.100 inch length.

(6) Install handle shaft bushing and ream inside diameter to 1.0010 (+0.0015, -0.0000) inches.

(7) Machine interlock bushing hole into a 0.57 x 0.69-inch slot. Cut slot in housing and shaft bushing as shown.

(8) Install ring bushing over the shaft and into slot in housing. Install housing on door; refer to Removal/Installation of Main Entrance and Service Door Mechanisms.

(9) Install trim panel on inside surface of door; refer to Chapter 25, EQUIPMENT/FURNISHINGS.

FORWARD MAIN ENTRANCE DOOR - DESCRIPTION AND OPERATION

1. General

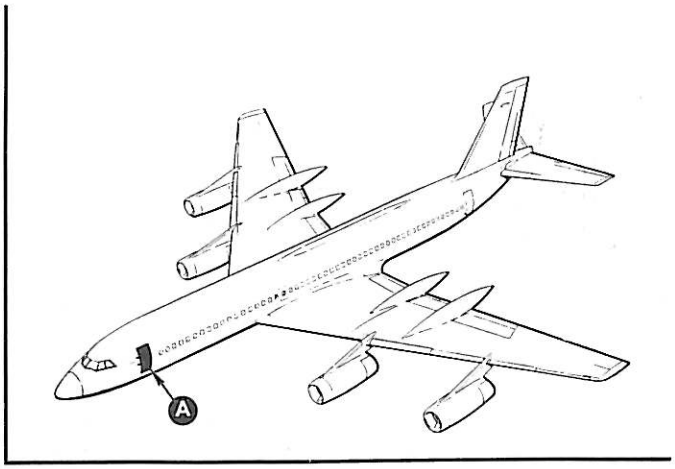
The forward main entrance door (see Figure 1) is approximately 30 x 74 inches in size and is located on the forward left side of the passenger cabin between fuselage stations 325 and 355 and may be opened from either outside or inside the cabin. Sealing around the door is provided by a molded bulb type wire-reinforced pressure seal which is energized by cabin pressure.

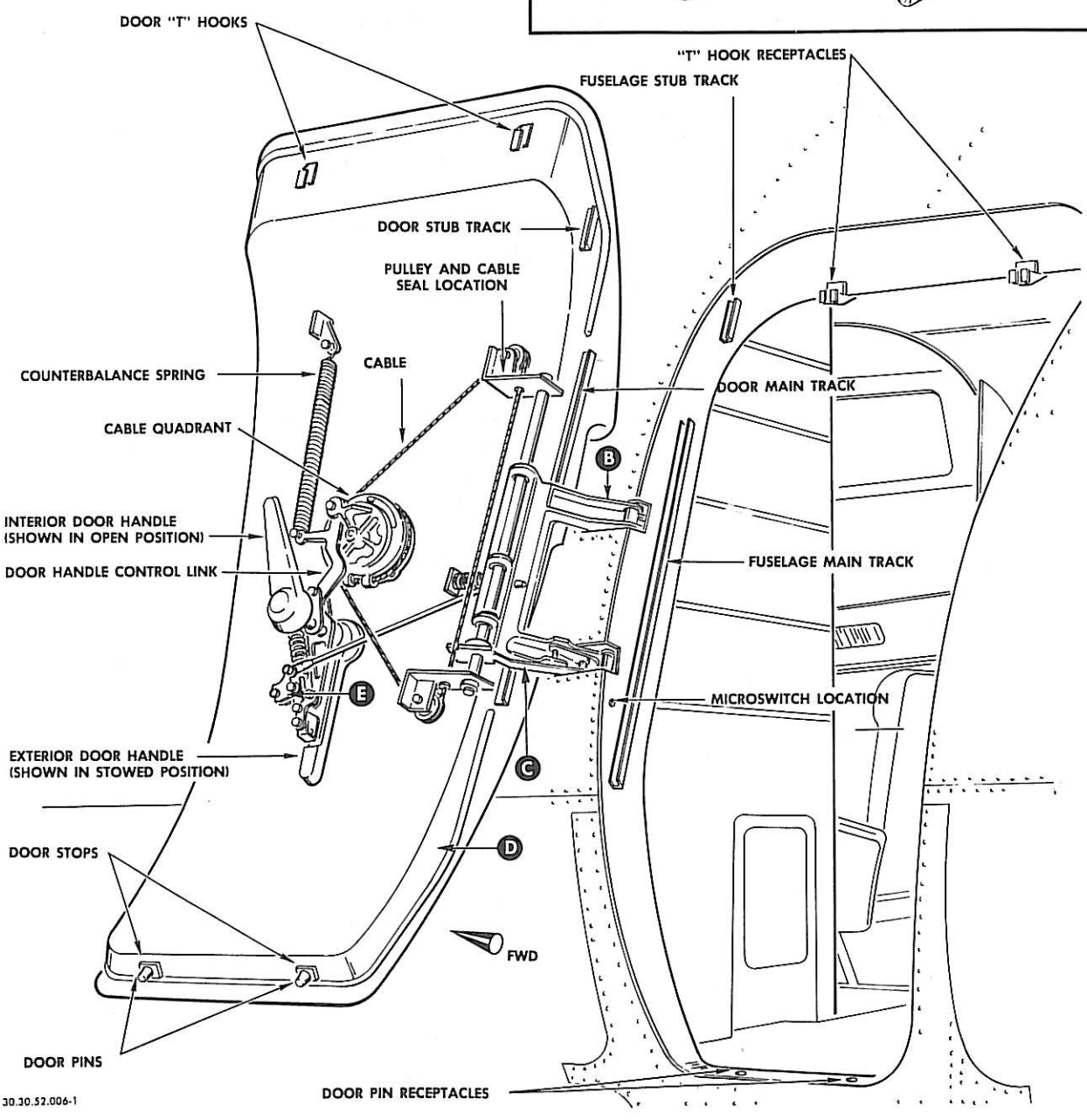
2. Structure

The forward main entrance door structure is of conventional 2024 and 7075 aluminum alloy, rib and skin construction that consists of an outside frame with interconnecting horizontal and vertical ribs. The door outer skin is riveted to and forms an integral part of the door frame and rib structure. A partial inner skin encloses part of the rib structure and forms vertical torque boxes along the forward and aft portion of the door and horizontal torque boxes at the top and bottom. The door handles are cast magnesium and the door operating mechanism supports are aluminum alloy castings. The interior surface of the door is covered with an acoustical material, and is trimmed compatible with the decor of the airplane interior.

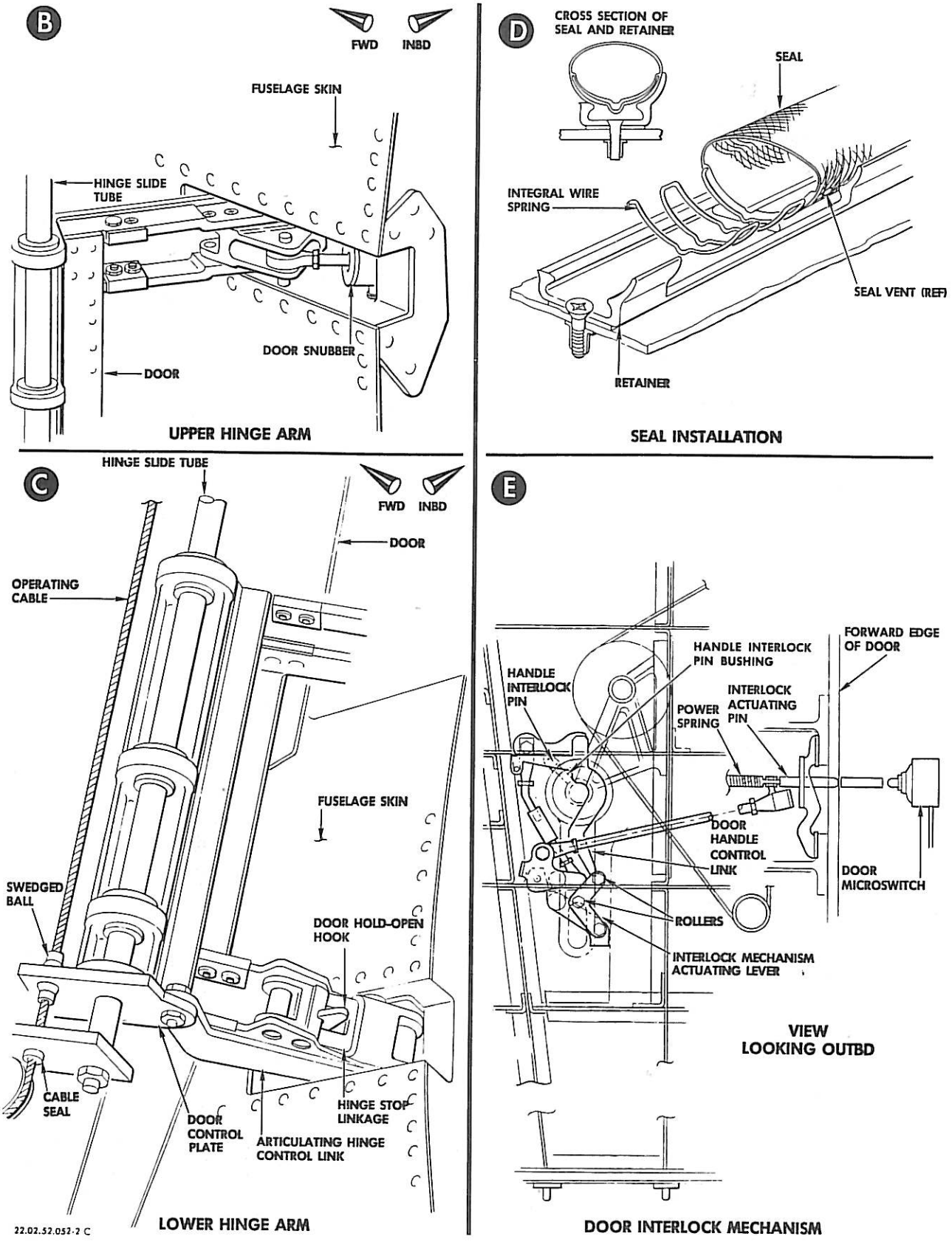
The continuous main door tracks bolt to the forward and aft edges of the door and mate with tracks in the fuselage structure. Also, a door stub track is located above, and offset from, the main door tracks on each side of the door. These stub tracks are fixed and mate with adjustable stub tracks in the upper fuselage door frame structure. Laminated shims are used to position the fuselage stub tracks in relation to the door stub tracks. Moly black epoxy top coating is applied to both the main door tracks and the stub tracks for chafe prevention. Refer to Chapter 51, STRUCTURES-GENERAL, for application procedure.

Two round door pins are located in the bottom edge of the door, and two "T" hooks are located along the upper edge. An adjustable door stop, positioned by laminated shims, is provided on each of the bottom edge door pins. These stops contact the fuselage threshold and limit vertical travel of the door into the tapered fuselage opening. The "T" hooks on the upper edge of the door mate with receptacles in the fuselage. These receptacles are adjustable inboard and outboard through a serrated horizontal plate. Laminated shims are installed behind the vertical attach leg of these receptacles to compensate for inboard and outboard adjustment. The two round door pins located on the bottom edge of the door mate with receptacles in the fuselage. A stud is installed in each of the receptacles to prevent "spike" heels or other small objects, from becoming lodged in the receptacles. A cup is clamped to the underside of each door pin receptacle to collect liquids and debris that may pass through the door pin hole.





Forward Main Entrance Door
Figure 1 (Sheet 1 of 2)


B
FWD
INBD
FUSELAGE SKIN
HINGE SLIDE TUBE
DOOR SNUBBER
DOOR
UPPER HINGE ARM
D
CROSS SECTION OF SEAL AND RETAINER
SEAL
INTEGRAL WIRE SPRING
SEAL VENT (REF)
RETAINER
SEAL INSTALLATION
C
HINGE SLIDE TUBE
FWD
INBD
DOOR
OPERATING CABLE
FUSELAGE SKIN
SWEDGED BALL
DOOR HOLD-OPEN HOOK
CABLE SEAL
DOOR CONTROL PLATE
ARTICULATING HINGE CONTROL LINK
HINGE STOP LINKAGE
22.02.52.052-2 C
LOWER HINGE ARM
E
FORWARD EDGE OF DOOR
HANDLE INTERLOCK PIN BUSHING
HANDLE INTERLOCK PIN
INTERLOCK ACTUATING PIN
POWER SPRING
DOOR HANDLE CONTROL LINK
DOOR MICROSWITCH
ROLLERS
INTERLOCK MECHANISM ACTUATING LEVER
VIEW LOOKING OUTBD
DOOR INTERLOCK MECHANISM

3. Door Operating Mechanism

The door operating mechanism on the forward main entrance door consists of an exterior and interior door control handle, door handle control link, a cable quadrant, door control plate, a counterbalance spring, a flexible operating cable, a hinge slide tube and articulating hinge linkages. Also included is a door interlock mechanism, a spring-loaded door hold-open hook, a door snubber and an upper and lower operating cable seal.

The exterior door handle on the forward main entrance door is recessed into the door, flush with the exterior surface of the airplane, and is installed on a coaxial shaft with the interior door handle. The interior door handle operates independently of the exterior handle; however, operation of the exterior handle results in movement of the interior handle. Door handle rotation is transmitted through the door handle control link to the cable quadrant. Each end of the flexible operating cable attaches to this cable quadrant. A swedged ball near the operating cable midpoint secures the cable in a recess in the door control plate at the door lower hinge arm attachment. The operating cable, being attached to the door control plate and the cable quadrant, provides the effecting means by which the door is raised, lowered, and locked into overcenter positions. The counterbalance spring aids in balancing the door weight as the door is raised, and provides a force for holding the mechanism overcenter in the fully open and closed positions.

The articulating hinge on the door will pivot so as to place the door forward of the door opening and parallel to the fuselage in the full open position. A snubber is mounted at the door upper hinge box and attaches to the door upper hinge arm to dampen the inertia forces of the door opening and closing. The hold-open hook and hinge-stop linkage are located at the door lower hinge arm and prevent the door from inadvertently closing or coming into contact with the fuselage when open.

The door operating mechanism is augmented by an interlock mechanism consisting of an interlock actuating pin on the forward edge of the door, a door handle interlock pin, interlock mechanism actuating lever, power spring and connecting push-pull rods and bell cranks. When the door is closed and locked, the interlock actuating pin on the forward edge of the door extends below a hook retainer on the forward door jamb. This pin serves as a fail-safe pin which will engage the hook retainer in the event the cinch-down mechanism malfunctions. The interlock actuating pin prevents the door from inadvertently opening; it also actuates the door microswitch to control the associated entrance lighting circuit (refer to Chapter 33, LIGHTS) and door-open warning light (refer to 52-6-0). The door handle interlock pin latches the handle up when the door is swung out of the opening; it prevents lowering of the door with the door in the open position. The door handle control link of the door operating mechanism operates the interlock mechanism actuating lever, and in turn sequences operation of the interlock actuating pin on the forward edge of door. The power spring provides an actuating force to operate the interlock actuating pin.

A. Door Mechanism Operation.

A single 180 degree rotation of the exterior or interior door control handle raises the door approximately nine inches to allow the door to be swung open. When opening the door from the outside, the exterior handle must be levered out of its recess before rotation can be initiated. Door handle extraction is accomplished by first depressing one end of a small lever in the handle. This action provides a projecting lever which may be gripped with the fingers. The door handle may then be pulled sufficiently from its recess to permit grasping the door handle with the other hand. Pulling the exterior handle outboard engages a driving dog on the exterior door handle shaft with the exterior door handle shaft and after initial rotation of the door handle, an outward pull is no longer necessary. The first 10 degrees of handle motion takes the door operating mechanism out of the overcenter configuration and retracts the interlock mechanism actuating pin on forward edge of door. The door microswitch, located forward of the door opening in the fuselage structure, deactuates and illuminates a warning light. Further rotation of the door control handle causes the door to rise, disengaging the upper door "T" hooks and the lower door pins that secure the door in the closed position.

At the completion of the nine-inch vertical travel (180 degrees of control handle rotation), the door tracks will clear the fuselage tracks, thus permitting the door to be pivoted outboard around the articulating hinge on the forward edge of the door. The overcenter action of the door operating mechanism will hold the door in the raised position.

As the door is opened outward, the interlock mechanism locks the door control handle to prevent lowering of the door. The articulating hinge changes the pivot points of the door as it rotates to the full open position, thus placing the door forward of the opening and parallel to the fuselage. An interior assist handle is also provided on the door as an aid in the physical operation of the door. Guidance of the door is not required as this is accomplished by the hinge mechanism.

A snubber at the door upper hinge arm dampens the inertia forces of the door when opening and closing. This snubber operates only during motion of the hinge and becomes increasingly more effective as the hinge approaches the fully open or fully closed position. The door is restrained in the full open position by the hinge stop linkage on the door lower hinge arm which is locked with a hold-open hook. This hold-open hook need not be held for position as it is spring-loaded and has a snap action.

Closing the door is accomplished by reversing the door opening procedure; however, the hold-open hook must be manually released when closing the door. It is finger operated in a direction toward the fuselage.

In the event the door handles are not engaged with each other then accomplishing the door closing cycle (when operating door mechanism from the outside), the exterior handle can be rotated 360 degrees until the driving dog re-engages the mating recess of the interior handle shaft. Engagement can only occur when the handles are in phase with each other due to the offset of the driver and mating recess from the door handle shaft centerline.

4. Seal

A bulb-type seal, (see Figure 1) energized by cabin pressure, is employed between the door and the door frame. Vent holes are provided in the inboard or pressurized side of this seal. Cabin pressure passes through these holes and forces the crown of the seal against the seal striker around the door opening.

The seal is constructed of tear-resistant silicone rubber, reinforced with Dacron fabric and contains an inner and outer pressure wall. The dual wall construction is a fail-safe feature to preclude loss of pressurization in the event of unforeseen damage to the outer pressure wall. The seal wall is also reinforced with a flexible spring steel wire, integrally molded within the seal, to eliminate the possibility of seal collapse. The internal spring wire supports the side walls of the seal against lateral pressure loads, when pressurized, to assure positive alignment with the fuselage striker. The seal is vulcanized as a single unit to fit the seal retainer around the periphery of the door.

The seal retainer is screw-fastened and riveted around the inside periphery of the door. The retainer consists of a formed section with two protruding lips along each side of its inner surface, near the base. These lips fit over the molded flanges along each side of the seal and restrain the seal in position.

5. Drainage Provisions

A. Hinge Structural Box Drain.

There are two nylon drain tubes installed to the upper and lower structural hinge boxes for moisture drainage. One drain tube is installed between the upper and lower hinge boxes to drain moisture from the upper hinge box into the lower hinge box. Another drain tube is installed to the bottom of the lower hinge box to a drain outlet in the fuselage skin.

B. Door Pin Receptacle Drain (Lower Shear Pins).

A cup is installed on the underside of each door pin receptacle to collect liquids and debris that may pass through the door pin hole. Clamped to the bottom of the cup is a flexible low pressure hose which in turn clamps to a drain outlet in the fuselage skin.

FORWARD MAIN ENTRANCE DOOR - TROUBLE SHOOTING

POSSIBLE CAUSE	ISOLATION PROCEDURE AND CORRECTION
1. DOOR DOES NOT OPERATE WITH HANDLE MOTION	
A. Sheared pin at attachment of door handle control link to fork on door interior handle shaft.	Replace pin.
B. Broken door operating cable.	Replace cable.
C. Interlock pin bushing partially out of door handle housing hub.	Remove door interlock mechanism access hole cover from inside surface of door trim panel or remove entire trim panel; refer to Chapter 25, EQUIPMENT/ FURNISHINGS. Push bushing into handle housing hub to free interlock mechanism. Incorporate bushing retainer clip on bushing at earliest opportunity; refer to 52-1-0, CABIN EXTERIOR DOORS Approved Repairs.
D. Cable midpoint ball out of slide tube control plate.	Replace cable midpoint ball in slide tube control plate and safety wire.
2. DOOR HANDLE OPERATING LOADS EXCESSIVELY HIGH	
A. Operating cable tension too high.	Readjust cable tension; refer to door Adjustment/Test procedure.
B. Door binding in fuselage opening.	Accomplish door Adjustment/Test procedure.
C. Burrs on door tracks or daggers.	Remove burrs, refer to Structural Repair Manual for Door Track Allowable Damage Limits.
3. DOOR OPERATING MECHANISM WILL NOT LOCK OVERCENTER IN DOOR FULLY RAISED AND LOWERED POSITIONS	
A. Operating cable tension too low.	Readjust cable tension; see door Adjustment/Test procedure.
B. Broken counterbalance spring.	Replace counterbalance spring.
4. HINGE FAIRING DOES NOT FAIR IN WITH FUSELAGE CONTOUR	
A. Nylon hinge fairing stop broken or out of adjustment.	Replace or adjust hinge stop; see door Adjustment/Test procedure.
B. Bent or broken hinge fairing link.	Replace hinge fairing link.

POSSIBLE CAUSE	ISOLATION PROCEDURE AND CORRECTION
5. INTERIOR AND EXTERIOR DOOR HANDLES NOT SYNCHRONIZED; INTERIOR HANDLE PROJECTS INBOARD APPROXIMATELY 0.75 INCH	
A. Service door interior door handle shaft installed to main entrance door.	Install proper shaft.
6. DOOR-OPEN WARNING LIGHT DOES NOT FUNCTION PROPERLY	
A. Circuit or light bulb malfunction.	Refer to DOOR-OPEN WARNING SYSTEM TROUBLE SHOOTING, Section 52-6-0.
7. INTERLOCK ACTUATING PIN, ON FORWARD EDGE OF DOOR IS NOT WITHDRAWING TO CLEAR HOOK RETAINER WHICH IS IMMEDIATELY ABOVE MICROSWITCH PLUNGER ON DOOR FORWARD JAMB--DOOR EITHER STOPS APPROXIMATELY TWO INCHES FROM CLOSING OR CANNOT BE OPENED WITH HANDLE MOTION	
A. Interlock actuating pin mechnism out of adjustment.	Adjust interlock actuating mechanism; refer to Adjustment/Test.
8. DOOR EXCEEDINGLY HARD TO OPEN OR CLOSE; ESPECIALLY IN THE HALF-WAY OPEN OR HALF-WAY CLOSED POSITION	
A. Broken snubber-to-door attachment bolt.	Replace snubber-to-door attachment bolt.
B. Snubber out of adjustment.	Adjust snubber; refer to Adjustment/Test procedure.
9. DOOR BINDS, CAUSING EXCESSIVE HANDLE LOAD; WILL NOT RAISE OR LOWER THE FULL AMOUNT OF TRAVEL	
A. Bent slide tube.	Replace slide tube.
10. FUSELAGE TRACKS AND DOOR TRACKS DO NOT PROPERLY MATE WHEN CLOSING DOOR	
A. Allowing door to free fall into closed position.	Manually assist door into closed position. Do not restrain door at inner handle, but on aft side of door inner surface.
11. DOOR JAMMED IN THE CLOSED POSITION	
A. Top edge of door skin damaged and caught on edge of fuselage skin.	Insert a thin piece of sheet metal, approximately two feet long, between door skin and fuselage skin. Sheet metal to act as a sliding surface which will prevent skin interference when door rises. Open door; reshape door skin and fuselage skin to proper contour.

POSSIBLE CAUSE	ISOLATION PROCEDURE AND CORRECTION
12. EXTERIOR DOOR HANDLE LOOSE	
A. Large coil spring broken inside interior door handle assembly.	Replace large coil spring.
13. EXTERIOR DOOR HANDLE ROTATES BUT WILL NOT ENGAGE TO RAISE DOOR	
A. Large coil spring broken inside interior door handle assembly.	Replace large coil spring.
14. DOOR LOOSE IN OPEN POSITION	
A. Due to continuous operation of door, dimension of 0.005 to 0.020-inch between the slide tube control plate and titanium rub strips has become excessive.	Add shims, as required, between the titanium rub strips and door structure to maintain the 0.005 to 0.020-inch dimension between the slide tube control plate and titanium rub strips.

FORWARD MAIN ENTRANCE DOOR - REMOVAL/INSTALLATION

1. Removal/Installation Forward Main Entrance Door Assembly (see Figure 401)

A. Equipment Required - None.

B. Remove Forward Main Entrance Door.

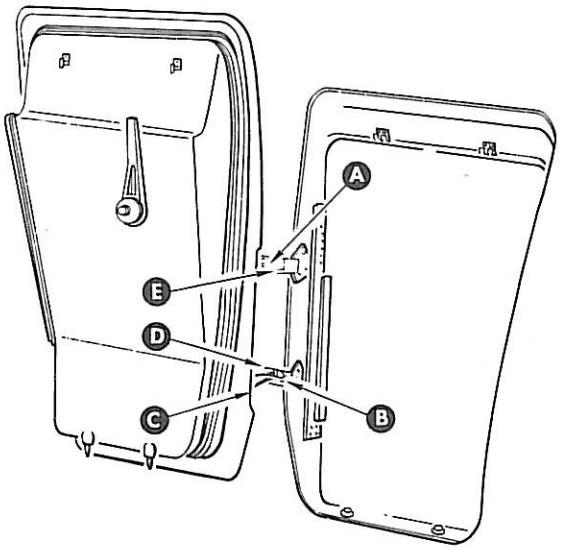
NOTE: Bag and tag loose hardware for ease of reinstallation.

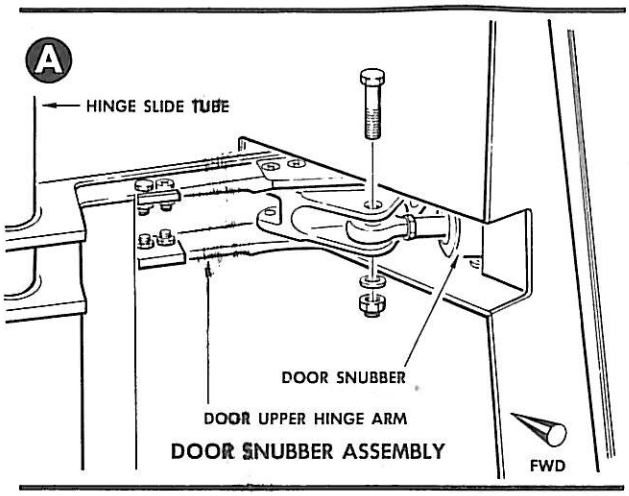
	Figure Detail
(1) Rotate door to open position.	
(2) Open access door in coat closet partition forward of door, adjacent to the door hinge boxes in fuselage.	
(3) Remove necessary insulation to gain access to the hinge attach bolts. (Refer to Chapter 25, EQUIPMENT/FURNISHINGS.)	
(4) Remove nut, washer, bolt, and bushing connecting rod end of door snubber to the door upper hinge arm.	A
(5) Remove nut, bolt, and bushing connecting hinge stop linkage to the lower hinge arm of door.	B
(6) Remove nut, bolt, and bushing connecting the articulating hinge control link to the door control plate.	C
(7) Provide adequate support for door.	
(8) Remove nut from upper and lower hinge arm attach bolts at the fuselage hinge boxes.	D & E
(9) Remove the lower hinge arm attach bolt.	D
(10) Remove the upper hinge arm attach bolt.	E
(11) Slide hinge arms out of the fuselage hinge boxes; retain washers and bushings used at hinge connection to the fuselage.	
(12) Remove door from fuselage.	

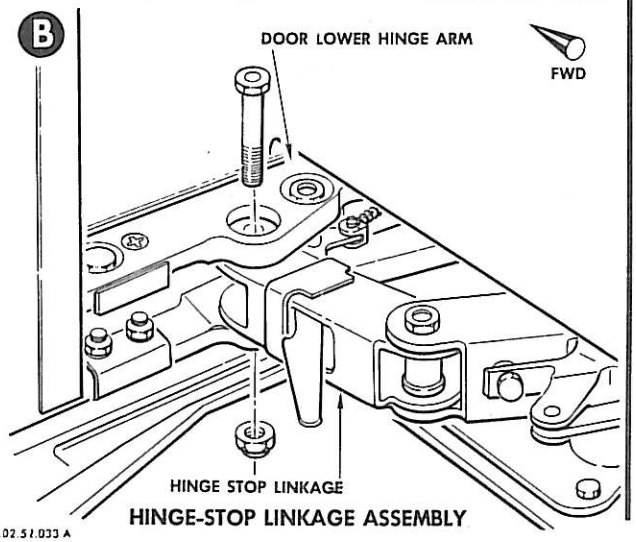
NOTE: Examine coating on door tracks. Repair (or replace) coating if it is worn sufficiently to expose bare metal. Refer to Chapter 51, STRUCTURES-GENERAL, for application procedure. By accomplishing this on door removal, time will by gained to allow coating to cure before reinstalling door.

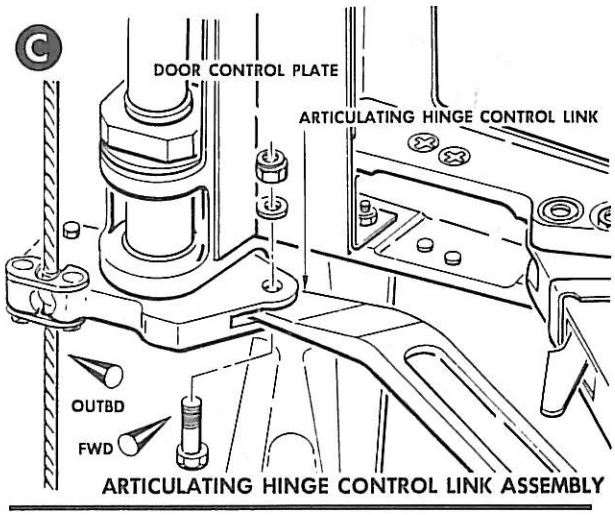
C. Install Forward Main Entrance Door.

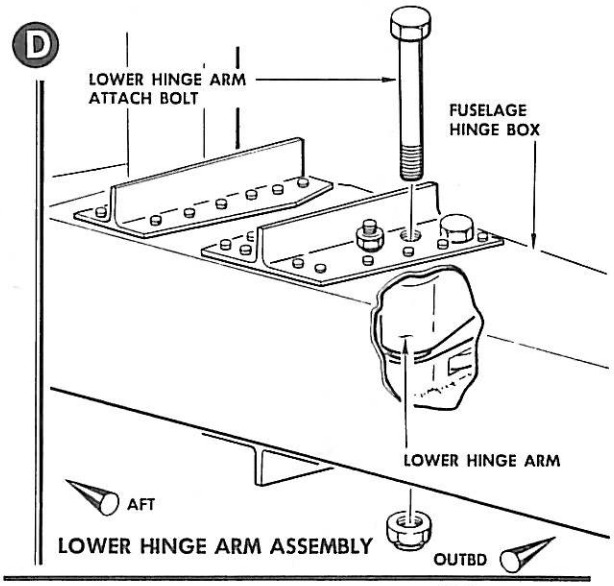
(1) Support forward main entrance door so hinge arms align with fuselage hinge boxes.	
(2) Insert bushings in the door hinge pivot fittings of the upper and lower hinge arms.	D & E
(3) Align hinge with attach holes in the fuselage hinge boxes.	


A
E
D
C
B


A
HINGE SLIDE TUBE
DOOR SNUBBER
DOOR UPPER HINGE ARM
DOOR SNUBBER ASSEMBLY
FWD


B
DOOR LOWER HINGE ARM
FWD
HINGE STOP LINKAGE
HINGE-STOP LINKAGE ASSEMBLY
22.02.51.033 A


C
DOOR CONTROL PLATE
ARTICULATING HINGE CONTROL LINK
OUTBD
FWD
ARTICULATING HINGE CONTROL LINK ASSEMBLY


D
LOWER HINGE ARM ATTACH BOLT
FUSELAGE HINGE BOX
LOWER HINGE ARM
AFT
LOWER HINGE ARM ASSEMBLY
OUTBD

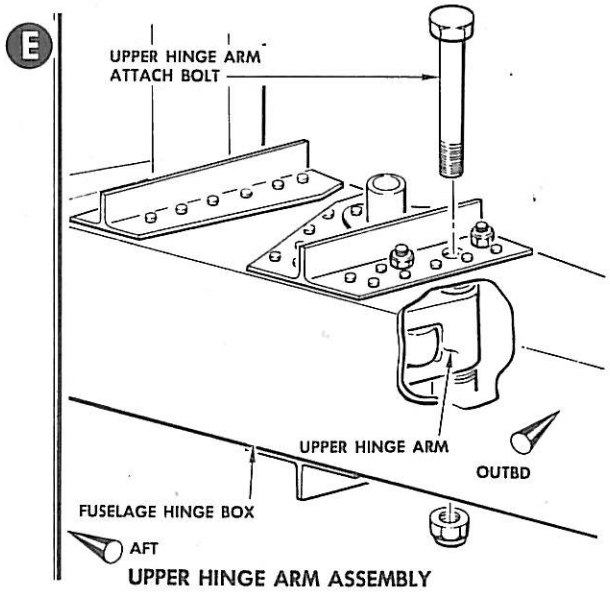

E
UPPER HINGE ARM ATTACH BOLT
UPPER HINGE ARM
OUTBD
FUSELAGE HINGE BOX
AFT
UPPER HINGE ARM ASSEMBLY

Figure
Detail

(4) Install a washer between hinge bushing and the fuselage hinge box, above and below each door hinge arm.

(5) Insert upper and lower hinge attach bolts through the fuselage hinge boxes, door hinge arms, bushings, and washers; install nuts.

(6) Insert bushing in the articulating hinge control link and align bushing with attach hole in the door control plate. C

(7) Install bolt and nut connecting the articulating hinge control link to the door control plate.

(8) Insert bushing in door hinge stop linkage and align with stop linkage attach hole in the lower door hinge arm. B

(9) Install bolt and nut connecting stop linkage to the hinge arm.

(10) Insert bushing in rod end of door snubber and align with snubber attach hole in the upper door hinge arm. A

(11) Install bolt, washer, and nut connecting snubber to the upper hinge arm of door.

(12) Accomplish forward main entrance door adjustment/test procedure.

2. Removal/Installation Forward Main Entrance Door Hinge (See Figure 402)

A. Equipment Required.

(1) Torque wrench calibrated in inch-pounds.

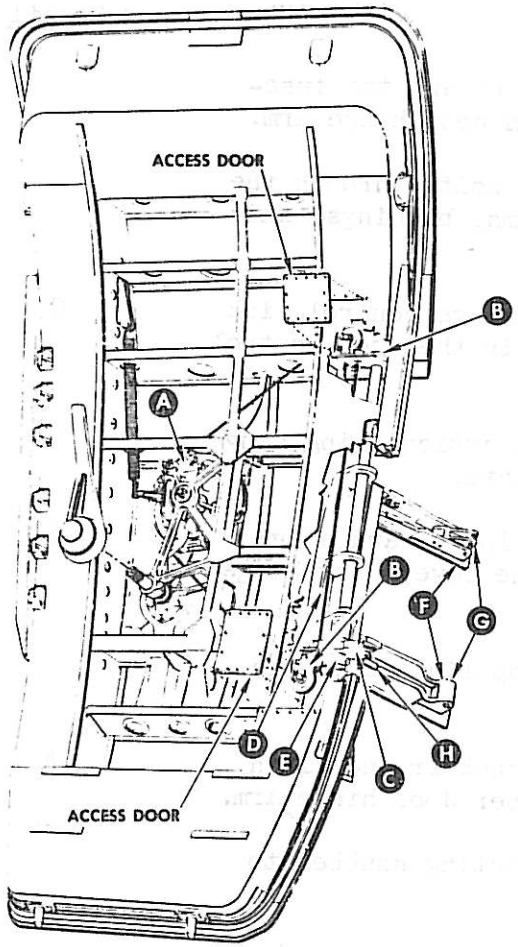
(2) Grease, Specification MIL-G-7421.

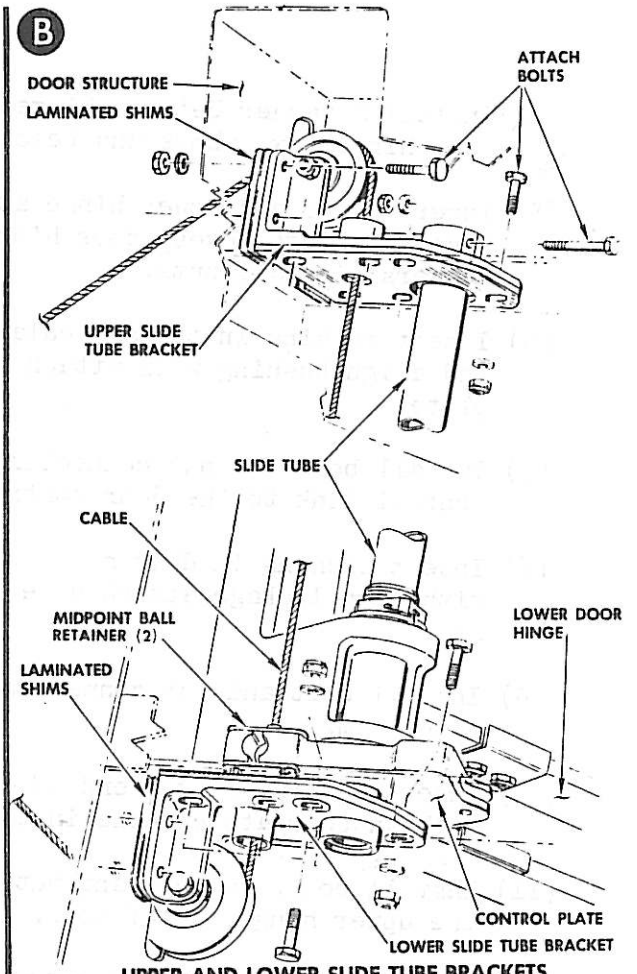
B. Remove Forward Main Entrance Door Hinge.

WARNING: ENSURE AGAINST DOOR HANDLE BEING MOVED INADVERTENTLY. IF HANDLE IS NOT HELD AS IT MOVES OVER CENTER, IT IS DANGEROUS AS THE COUNTERBALANCE SPRING MOVES THE HANDLE WITH A FORCE IN EXCESS OF 70 POUNDS.

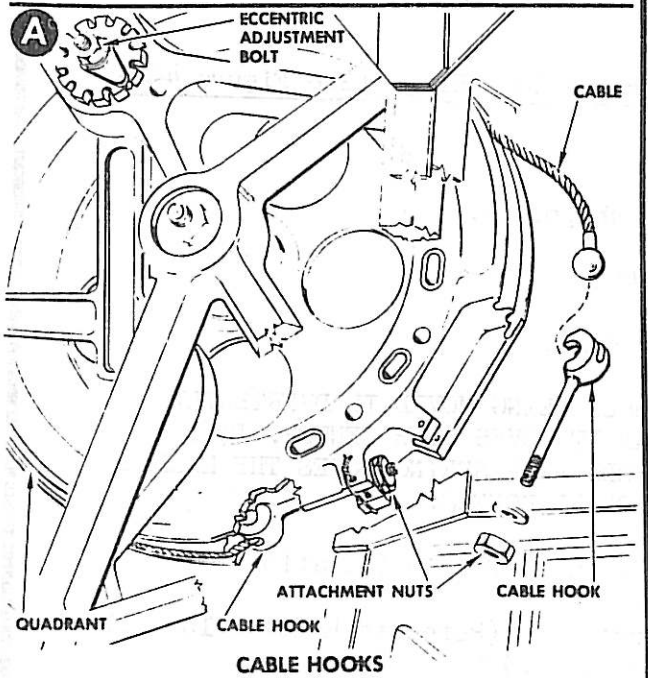
NOTE: Bag and tag loose parts for ease of reinstallation.

(1) Remove door assembly from airplane. (Refer to Removal/Installation Forward Main Entrance Door Assembly.)

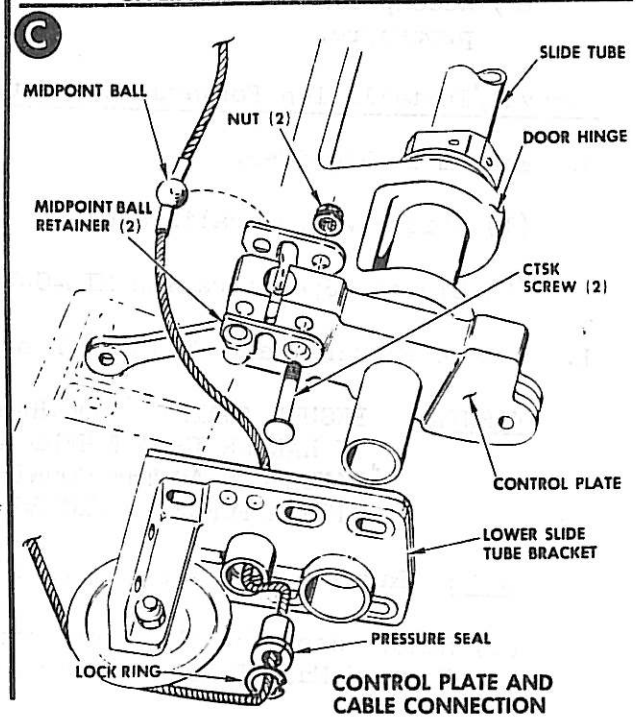




UPPER AND LOWER SLIDE TUBE BRACKETS

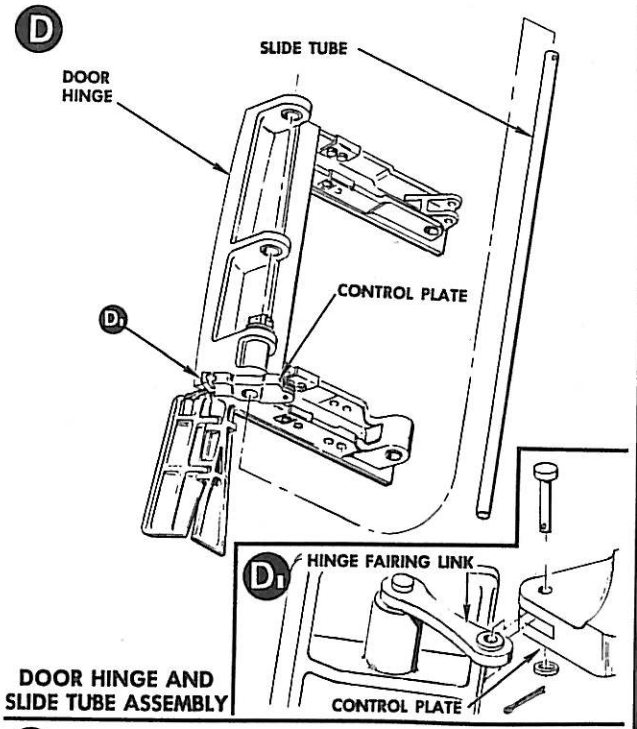


CABLE HOOKS

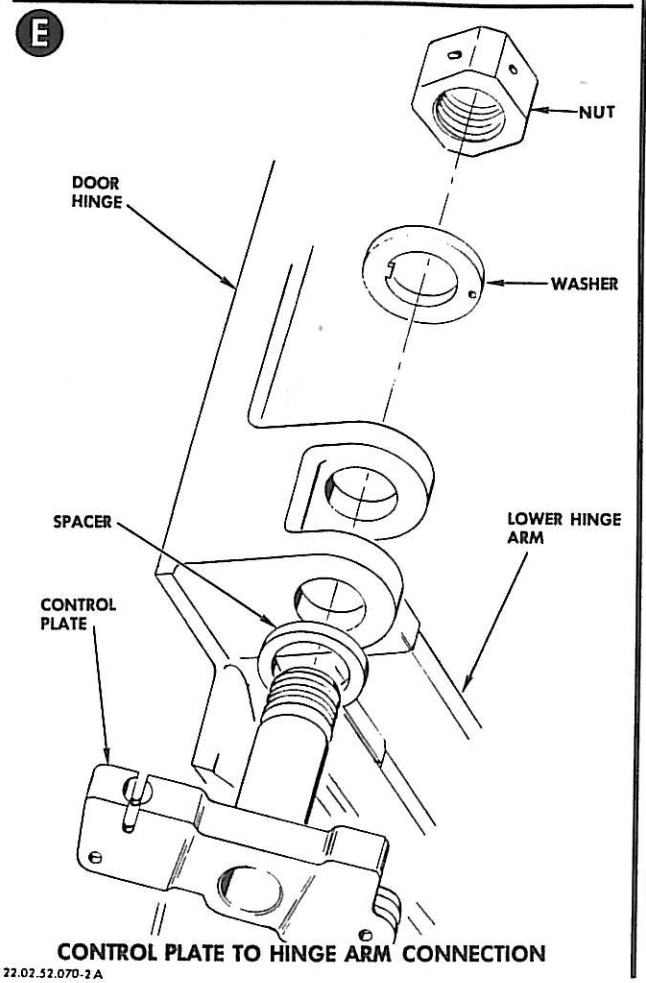


CONTROL PLATE AND CABLE CONNECTION

22 07 52 070-1B

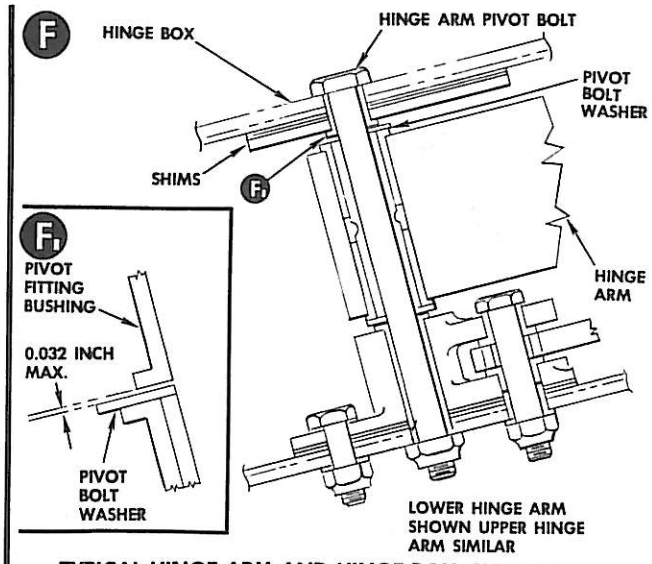


DOOR HINGE AND SLIDE TUBE ASSEMBLY

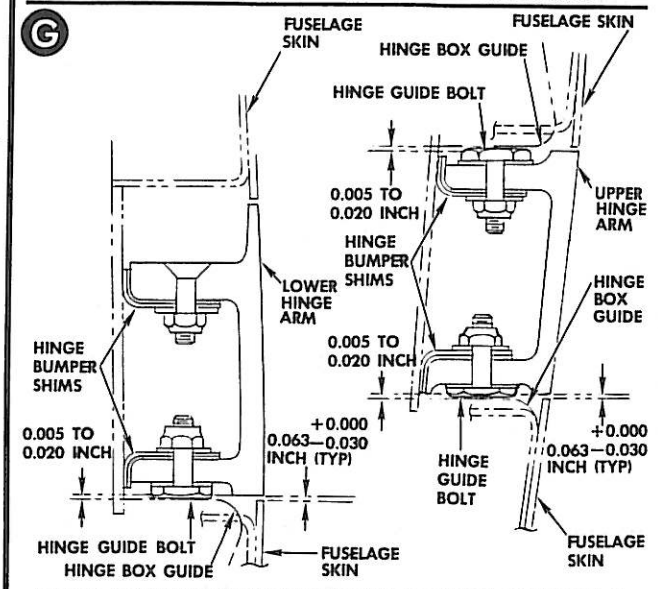


CONTROL PLATE TO HINGE ARM CONNECTION

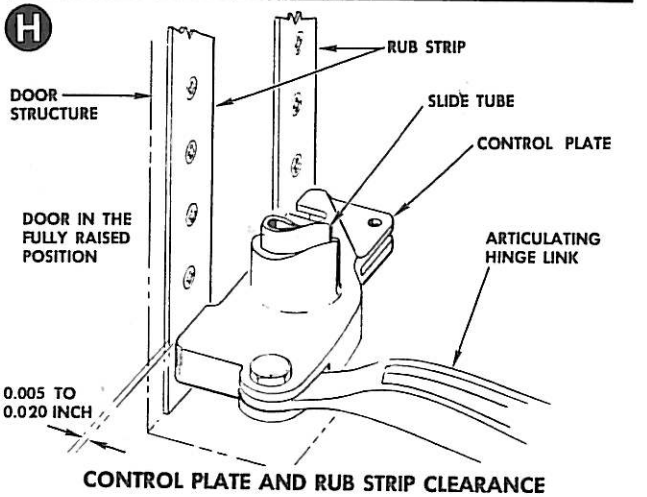
22.02.52.070-2 A



TYPICAL HINGE ARM AND HINGE BOX CLEARANCE



HINGE GUIDE BOLT AND HINGE BOX GUIDE CLEARANCE



CONTROL PLATE AND RUB STRIP CLEARANCE

Figure Detail

(2) Remove door interior control handle. (Refer to 52-1-0.)

(3) Remove door interior trim and necessary soundproofing. (Refer to Chapter 25, EQUIPMENT/FURNISHINGS.)

(4) Remove the slide tube bracket access doors on the forward interior surface of the door.

(5) Loosen nuts on cable hooks at the cable quadrant and disconnect cable ends. — A

(6) Remove nut and bolt securing slide tube to the upper slide tube bracket. — B

(7) At each slide tube bracket remove bolts, washers, and nuts securing brackets to the door structure; remove laminated shims. — B

(8) Slide the slide tube brackets off each end of the slide tube. — C

(9) Remove cable midpoint ball retainers, or safety wire from door control plate; remove cable midpoint ball from slot in door control plate.

(10) Remove door hinge and slide tube from the door. — D

(11) Remove slide tube from the door hinge arm fittings. — D

(12) Remove cotter pin, washer, and pin attaching hinge fairing link to the door control plate. — D1

(13) Cut lockwire and remove nut, washer, and spacer securing door control plate to the door lower hinge arm; remove door control plate. — E

C. Install Forward Main Entrance Door Hinge.

NOTE: Steps (1) through (4) apply to installation of a new door hinge, or replacement of the hinge arm pivot fittings within the fuselage hinge boxes. These steps may be omitted if original hinge and hinge arm pivot fittings are being reinstalled.

(1) With door removed from hinge, temporarily install door hinge in the fuselage hinge boxes. (Refer to Removal/Installation Forward Main Entrance Door, steps C.(1) through C.(5).) — F

Figure
Detail

(2) Rotate door hinge to the open position

(a) Measure clearance between the upper hinge arm pivot fitting and pivot bolt washer at each fuselage hinge box. Clearance shall be 0.032 inch maximum. — F1

(b) Add or remove shims between the hinge arm pivot fittings and the fuselage hinge boxes to obtain proper clearance. — F

(3) Rotate door hinge to the closed position.

(a) Add or remove washers under heads of the hinge guide bolts to obtain 0.005 to 0.020-inch clearance between bolthead and the fuselage hinge box guides. — G

(b) If necessary trim the fuselage hinge box guides to obtain correct clearances. — G

(c) Remove or add hinge bumper shims as required to make hinge fair in with fuselage in the door-closed position. — G

NOTE: There shall be a minimum of one shim installed at each bumper location.

(d) Clearance between hinge arms and the fuselage skin shall be 0.063 (+0.000, -0.030) inch. Trim hinge as required. — G

(4) Remove door hinge from the fuselage hinge boxes.

(5) Insert shank of door control plate through lower hinge arm fitting with threaded end towards the upper hinge arm. — E

(a) Install spacer, washer, and nut.

(b) Torque nut 10 to 20 inch-pounds and lockwire.

(6) Install pin, washer, and cotter pin connecting hinge fairing link to the door control plate. — D

(7) Lubricate slide tube with specified grease. Insert slide tube through the hinge arm fittings, with bolt hole at the top.

(8) Position door hinge and slide tube in door. — C

Figure Detail

(9) Engage midpoint ball of operating cable in the door control plate slot and install cable midpoint ball retainers, if available, or safety wire.

NOTE: Longest section of the cable, measured from the midpoint ball, routes through the upper cable pulley.

(10) Install the slide tube brackets on each end of the slide tube. — B

NOTE: To facilitate adjustment, do not install shims behind vertical attach legs of the slide tube brackets until door adjustment/test procedure is accomplished.

(11) Install bolt and nut securing slide tube to the upper slide tube bracket. — B

(12) Connect cable ends to cable quadrant. Lock wire cable hooks in hook slots of quadrant. — A

(13) Temporarily reinstall the door interior control handle. (Refer to 52-1-0.)

(14) With the door control handle in the open position, check clearance between the lower surface of the door control plate and top of the bolt retainers in the bottom of the slide tube well. — B

(a) Control plate shall clear bolt retainers. Adjust cable hooks to provide this clearance. — A

(b) Tighten cable hook nuts sufficiently to remove all slack in the operating cable. — A

(15) Check clearance between edge of the door control plate and rub strips inside the slide tube well for full distance of travel. — H

NOTE: The interlock mechanism actuating pin on forward edge of door must be manually actuated in order to operate door mechanism.

(a) Minimum permissible clearance is 0.005 inch through full travel. The last one inch travel to the full up position shall be within 0.005 to 0.020 inch. — H

(b) Add or remove shims behind rub strips to obtain proper clearance. — H

Figure Detail

(16) Install door assembly on airplane. (Refer to Removal/ Installation Forward Main Entrance Door.)

3. Removal/Installation Door Pin Receptacle Drain Cup (see Figure 403)

A. Equipment Required - None.

B. Remove Door Pin Receptacle Drain Cup.

(1) Remove tread plate and carpet on floor panel inboard of door threshold. (Refer to Chapter 25, EQUIPMENT/ FURNISHINGS.) — A

(2) Remove floor panel inboard of door threshold. — A

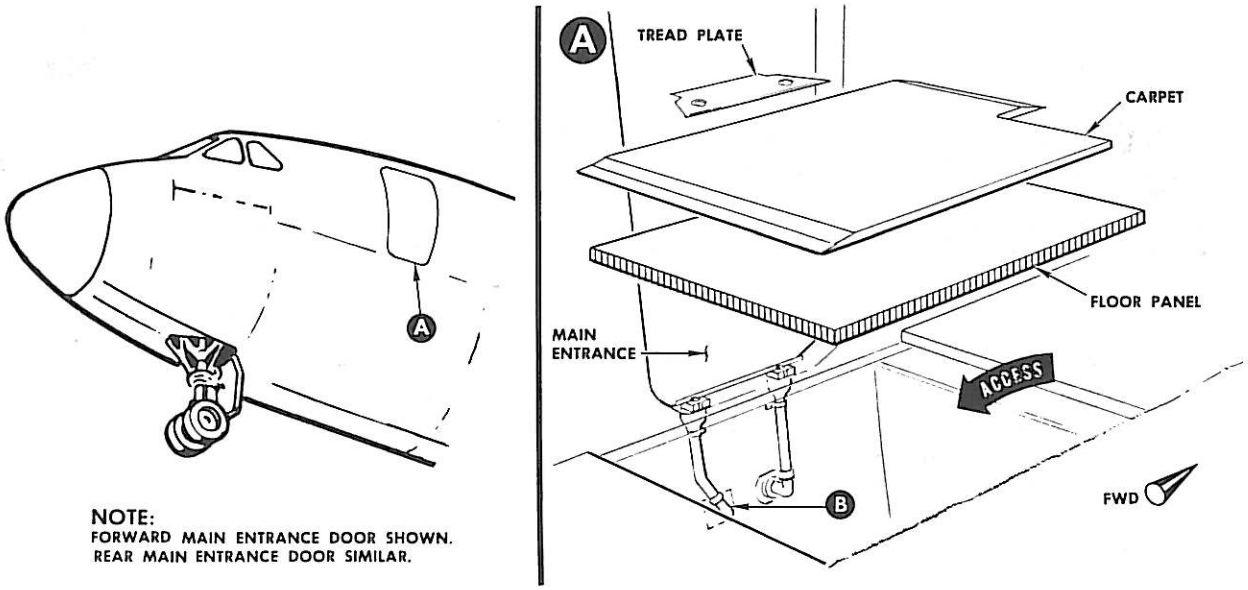
(3) Remove screw attaching hose clamp, on bottom of cup, to stringer. — B

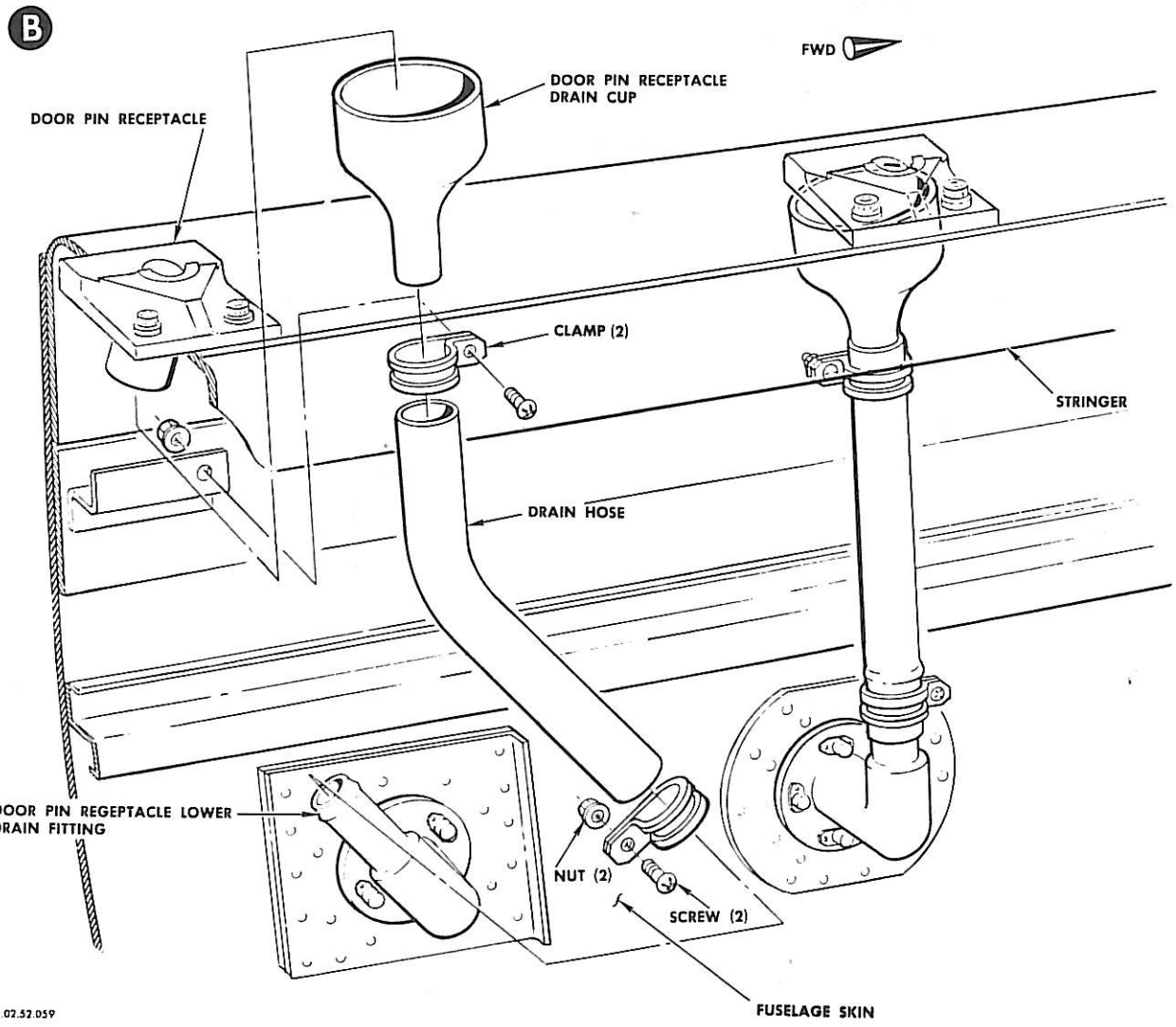
(4) Remove drain cup. — B

C. Install Door Pin Receptacle Drain Adapter.

(1) Slide drain hose over lower end of drain cup and install clamp around hose and attach to stringer. — B

(2) Install floor panel inboard of door threshold, install carpet. (Refer to Chapter 25, EQUIPMENT/FURNISHINGS.) — A





Main Entrance Door Pin Receptacle Drain Cup Installation
Figure 403

FORWARD MAIN ENTRANCE DOOR - ADJUSTMENT/TEST

1. Adjustment/Test Forward Main Entrance Door (see Figure 501)

NOTE: All of the following steps apply after installation of a new door, new hinge, or reinstallation of a door where slide tube, pulley brackets, or door hinge have been removed or disturbed. On door adjustments where slide tube, pulley brackets, or door hinge have not been removed or disturbed, the steps marked by an asterisk* need not be accomplished.

A. Equipment Required:

(1) Calibrated cable tensiometer capable of measuring tension loads of 270 to 770 pounds.

(2) Spring scale or torque wrench with special adapter (Convair TSTO 22-57156, which fits over the inner handle hub).

B. Adjust Forward Main Entrance Door.

CAUTION: WHEN CLOSING DOOR NEVER ALLOW DOOR TO FREE FALL INTO DOOR OPENING; DAMAGE TO DOOR HINGE MECHANISM MAY OCCUR. MANUALLY ASSIST DOOR INTO CLOSED POSITION. DO NOT RESTRAIN DOOR AT INNER HANDLE, BUT ON AFT SIDE OF DOOR INNER SURFACE.

(1) Slowly swing door outward and forward until the door hinge-stop linkage bottoms out.

NOTE: When the door hinge-stop linkage bottoms out the door hold-open hook should engage stop linkage.

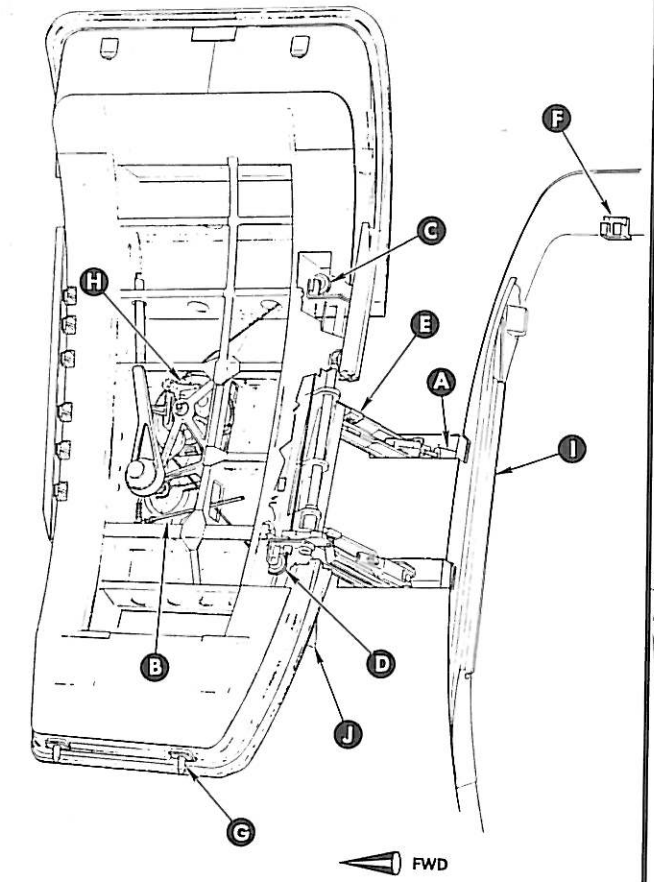
(a) Move door aft until hinge is near midpoint of full travel. Loosen jam nut on snubber piston shaft and rotate shaft to lengthen, until retracted snubber piston is felt to bottom, while moving door gently about midpoint of travel. Shorten snubber piston shaft by rotating one full turn; retighten jam nut. Slowly rotate door to fully opened and fully closed positions to determine that snubber is not bottoming at extremes of travel.

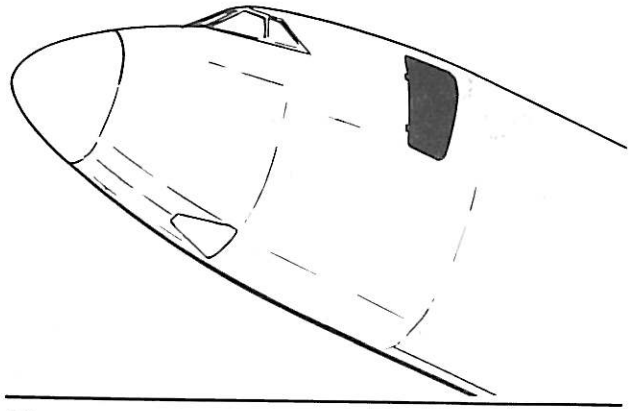
(2) Check the exterior door handle fair-in; refer to 52-1-0.

(3) Remove the interior door control handle; refer to 52-1-0.

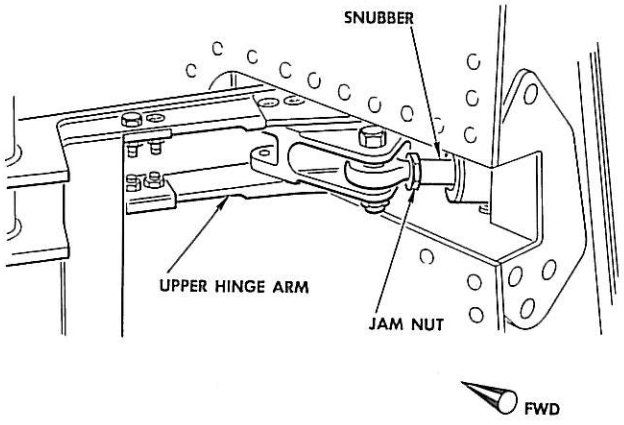
(4) Remove interior trim and necessary soundproofing as directed in Chapter 25, EQUIPMENT/FURNISHINGS.

(5) Temporarily reinstall interior door handle to accomplish door adjustments.





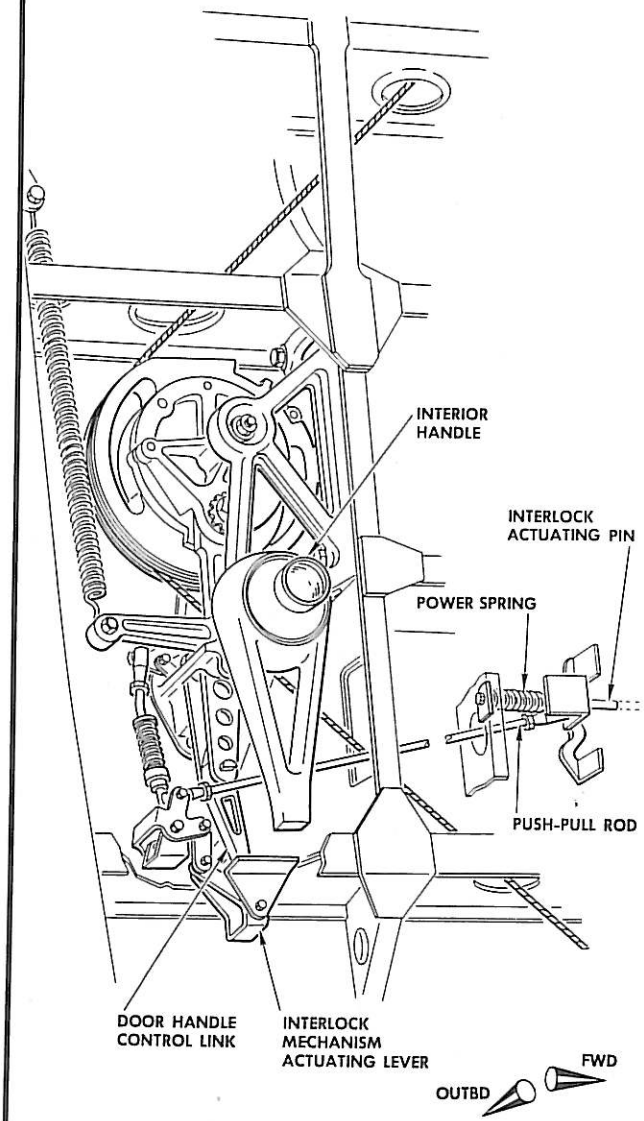
A



30 02 52.022

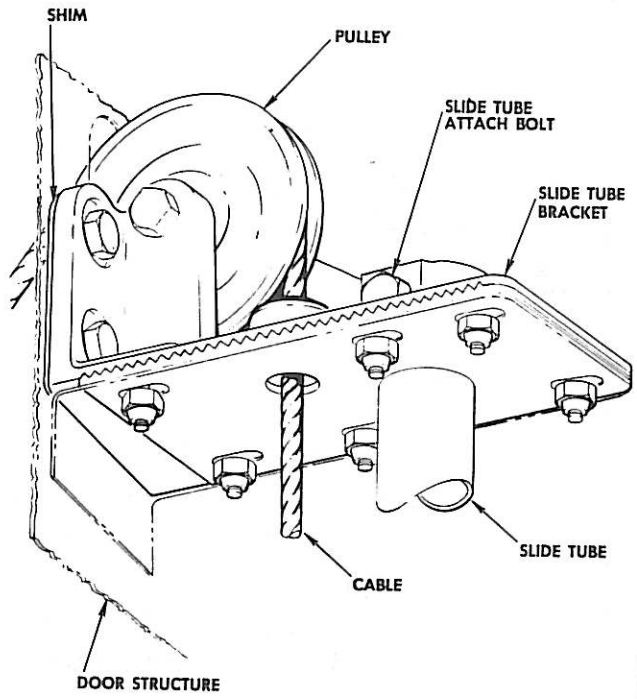
DOOR SNUBBER

B



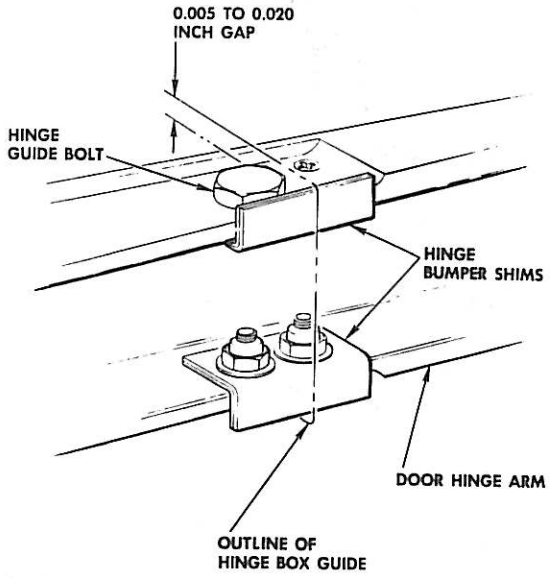
INTERLOCK MECHANISM

C



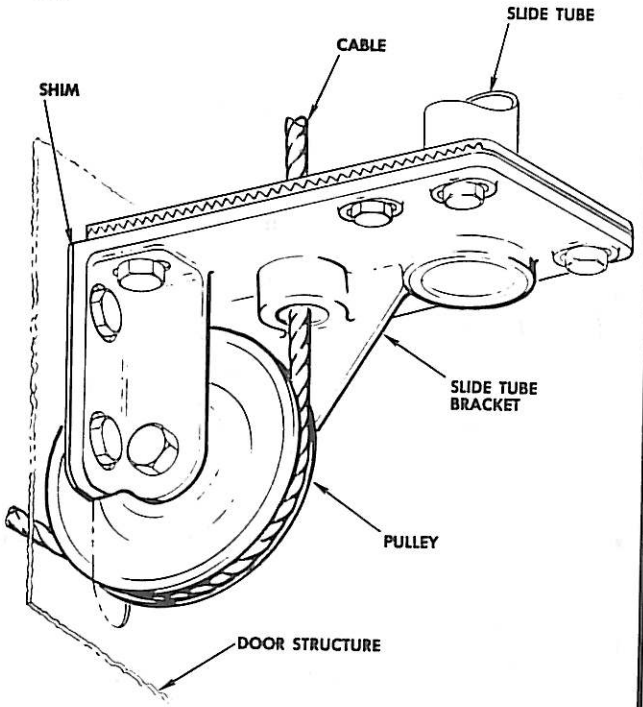
UPPER SLIDE TUBE AND PULLEY BRACKET

E



HINGE-ARM TO HINGE BOX GUIDE CLEARANCE

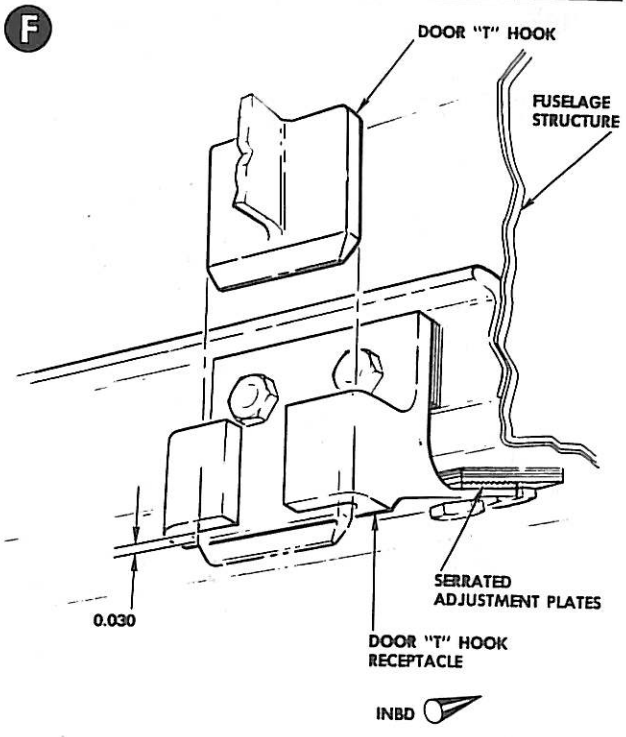
D



22.02.52.044-2B

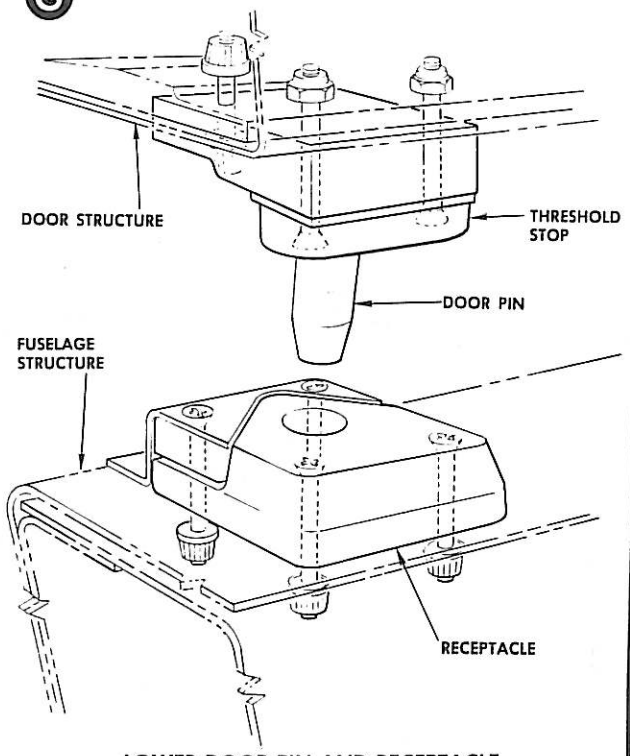
LOWER SLIDE TUBE AND PULLEY BRACKET

F



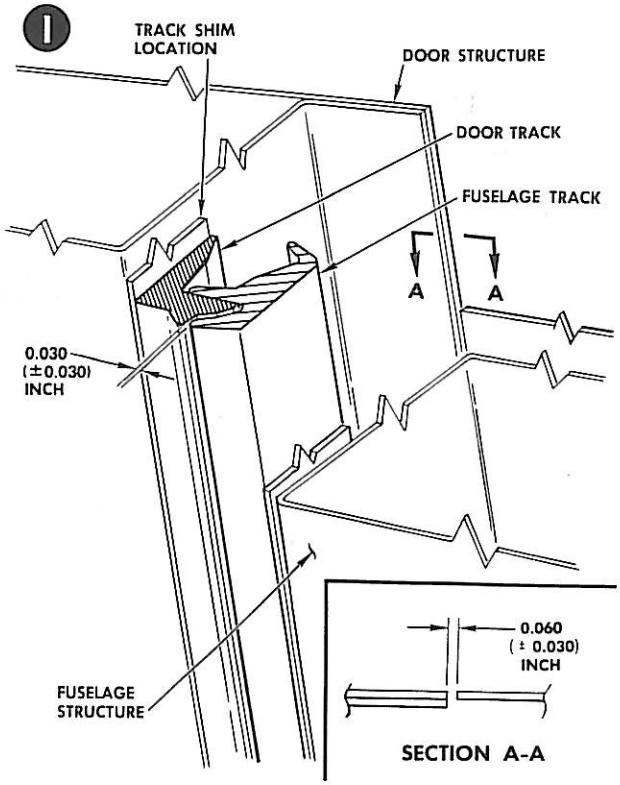
DOOR UPPER "T" HOOK AND RECEPTACLE

G



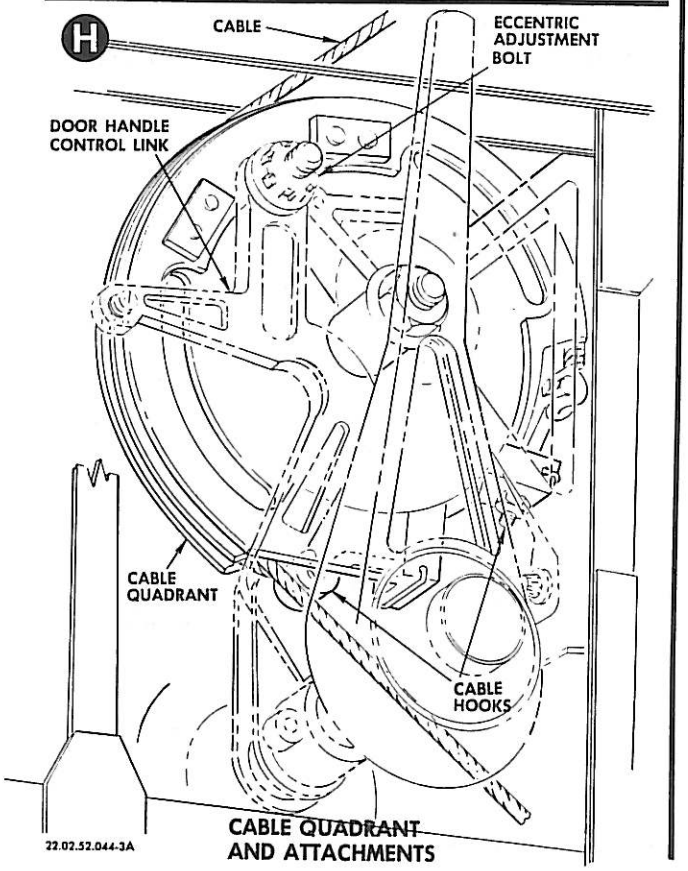
LOWER DOOR PIN AND RECEPTACLE

I



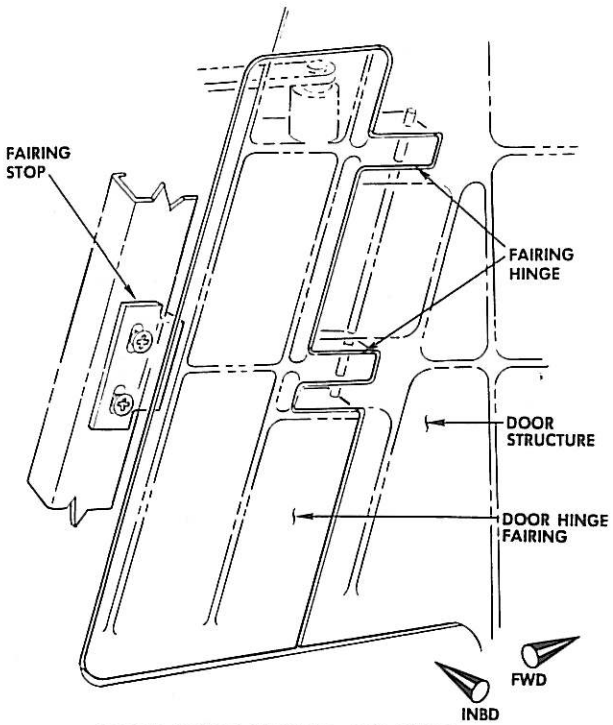
DOOR TRACK CLEARANCE

H



CABLE QUADRANT AND ATTACHMENTS

J



DOOR HINGE FAIRING AND STOP

(6) With door closed, place inside handle in the full overcenter and locked position. Check tension load of upper portion of operating cable. If tension load is not within the range of 700 (±70) pounds, raise door four to six inches and adjust nut on cable hook for upper cable section. Close and lock door for tension load recheck.

Figure Detail

(7) With door closed, and inner handle in full overcenter and locked position, check tension load of power portion of operating cable. If tension load is not within the range of 300 (±30) pounds, raise door four to six inches and adjust nut on cable hook for lower cable section. Close and lock door for tension load recheck.

NOTE: Adjustment of each section of cable will require re-adjustment of the opposite section until both are within tolerance.

(8) Raise and rotate door outward to full open position, depress interlock mechanism actuating pin on forward edge of door and secure so that handle interlock pin is withdrawn from the door handle shaft. B

(9) Disconnect the interlock mechanism push-pull rod from the interlock actuating lever at lower end of door handle control link. B

CAUTION: DO NOT ROTATE DOOR HANDLE TO "CLOSED" POSITION WITH DOOR OPEN AND INTERLOCK MECHANISM DISCONNECTED; DAMAGE TO DOOR HINGE FAIRING WILL RESULT.

*(10) To accomplish this step, gain access to slide tube and pulley brackets by removing the two small access plates on the forward inner surface of door. Remove nuts, washers, and bolts attaching vertical leg of each slide tube and pulley bracket to door structure and remove laminated shims. Loosen remaining slide tube and pulley bracket attach bolts. C & D

NOTE: The slide tube and pulley brackets are loosened to permit shifting of the slide tube assembly in a fore or aft direction to align door and prevent cocking as door lowers.

(11) Rotate door 30 degrees to open position (approximately) and check hinge clearances.

(a) Remove or add washers under heads of hinge guide bolts to obtain 0.005 to 0.020-inch clearance between bolt head and the fuselage hinge box guides. E

(b) If necessary, trim the fuselage hinge box guides to obtain correct clearance.

*Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.

(c) Remove or add hinge bumper shims as required to make hinge fair in with fuselage in a door-closed position. — Figure Detail

NOTE: There shall be a minimum of one shim installed at each bumper location.

(12) Slowly lower door into the fuselage opening.

(a) Check door-to-fuselage skin clearances. For new doors, trim as necessary. Avoid excessive trim as final trim cannot be accomplished until after completion of slide tube adjustment.

(b) From inside the airplane, check alignment of the lower door pins and the upper "T" hooks with their receptacles as they begin to mesh.

CAUTION: DO NOT FORCE DOOR.

*(c) Shift slide tube and pulley brackets accordingly to accomplish door fore-and-aft alignment. — C & D

*(d) Measure inboard and outboard door hook and receptacle alignment at top of door. If misalignment exceeds 0.015 inch, open door and adjust the fuselage mounted "T" hook receptacles in an inboard or outboard direction. The receptacles are serrated to allow adjustment in increments of 0.032 inch. — F

NOTE: Shifting of the hook receptacles must be accompanied by varying the thickness of laminated shims at both attaching legs of the "T" hook receptacles. Do not bend attaching legs of hook receptacles when tightening bolts. Shims are adjustable within 0.003 inch which is maximum gap permissible before tightening bolts.

*(13) Repeat steps (12) (a) through (12) (d) until the lower door pins and the upper "T" hooks align with their receptacles within 0.015 inch in all directions. The 0.015 inch dimension is taken at the full width section of the hooks and pins. — F & G

*Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.

Figure Detail

(14) Lower door until the threshold stops on the lower door pins contact the pin receptacles. If gap between receptacle and threshold stop is greater than 0.030 inches, adjust nuts on the operating cable hooks to allow door to bottom fully on the threshold stops. Recheck cable tension as directed in steps (6) and (7). — G & H

*(15) Continue motion of the door handle until it overcenters.

(a) Check that full width section of the upper door "T" hooks extend through their receptacles a minimum of 0.030 inch. Add or remove shims behind the threshold stops on the lower door pins as required. — F & G

*(b) Check gaps at main tracks and stub tracks on forward and aft edges of door. Gap at main track shall be 0.030 (±0.030) inch at any portion of track, both sides of door. — I

NOTE: It may be necessary during initial check of the main track clearance to remove stub track shims to allow full motion of the main tracks within their tolerances. These shims are fuselage mounted. The main door tracks also may be shimmed up to 0.060 inch maximum to obtain correct clearance.

WARNING: DO NOT FILE TRACKS.

*(c) After main track gap has been established, add or remove shims at the stub tracks each side of the door to maintain 0.000 to 0.030 inch gap. Stub track adjustment shall insure that sum of main track gap on either side of the door and the gap at the stub track on opposite side of door does not exceed 0.060 inch.

*(16) With door fully closed, make final adjustment to slide tube and pulley brackets at each end of the slide tube. Brackets are serrated for adjustment in increments of 0.032 inch.

(a) Add correct amount of shims behind vertical leg of each slide tube and pulley bracket and secure.

(b) Door shall clear fuselage skin 0.060 (+0.030) inch; trim as necessary. — I

*Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.

Figure
Detail

NOTE: Fuselage skin clearance must exceed track gap.

(c) For allowable mismatch between door and fuselage skin; refer to Figure 502.

NOTE: A maximum of one tapered shim, tapered 0.030 to 0.060 inch in a forward or aft direction or tapered in an inboard or outboard direction may be installed between each lower door pin and the door structure to assist alignment. Use shims only if necessary to align door pins with their receptacles.

(17) Rotate door handle toward the OPEN position.

(a) Door shall begin to lift at approximately 8.5 degrees minimum handle rotation.

(b) With door fully raised and open, check for clearance between lower surface of door control plate and top of bolt retainers in bottom of slide tube well. H

(18) Adjust nylon hinge fairing stop on the forward inner surface of the door to hold the hinge fairing in contour when door is in the fully closed position. J

NOTE: The hinge fairing stop is slotted to permit adjustment.

(19) Free the interlock mechanism and reconnect the aft push-pull rod of the interlock mechanism to the interlock actuating lever at the lower end of the door handle control link. B

(20) With door fully raised and open, adjust the interlock mechanism to meet the following conditions:

(a) Handle interlock pin is fully inserted into handle shaft.

(b) Interlock actuating pin on forward edge of door is fully extended. Switch pin on fuselage door frame should be extended 0.2 inch. B

Figure Detail

(c) With door closed and inner handle overcenter and bottomed out, upper roller on the interlock mechanism actuating lever should contact door handle control link. If link does not contact roller, lengthen handle latch push-pull rod and, to compensate, shorten interlock pin push-pull rod. B & H

CAUTION: WHEN CLOSING DOOR NEVER ALLOW DOOR TO FREE FALL INTO DOOR OPENING; DAMAGE TO DOOR HINGE MECHANISM MAY OCCUR. MANUALLY ASSIST DOOR INTO CLOSED POSITION. DO NOT RESTRAIN DOOR AT INNER HANDLE, BUT ON AFT SIDE OF DOOR INNER SURFACE.

(21) Raise door carefully and swing out of opening. Check that door handle is locked to prevent lowering of door when door is approximately 20 degrees out of opening.

CAUTION: IN THE EVENT THE INTERLOCK MECHANISM IS NOT ENGAGED IN THE DOOR HANDLE SHAFT, DO NOT LOWER DOOR; DAMAGE TO HINGE FAIRING WILL RESULT.

(22) Swing door closed and lower carefully. Check that the interlock actuating pin on forward edge of door extends below interlock hook on door jamb.

(23) Using a spring scale, or torque wrench with special adapter made to fit inner handle hub, check door handle operating loads. Using a spring scale, handle loads shall not exceed 50 pounds through full range of travel with trim panel removed or 70 pounds with trim panel installed. Using a torque wrench with special adapter, handle loads are measured in foot-pounds; 50 foot-pounds through full range of travel with trim panel removed or 70 foot-pounds with trim panel installed.

NOTE: If spring scale is used handle loads are measured perpendicular to a point on handle 10 inches from center of handle hub, in direction of rotation.

*(24) When hinge assembly or door assembly has been replaced, reinstall the slide tube and pulley bracket access doors on the interior surface of the door.

(25) Remove the interior door handle and reinstall the soundproofing and door interior trim; Refer to Chapter 25, EQUIPMENT/FURNISHINGS.

*Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.

(26) Reinstall the interior door control handle; Refer to 52-1-0.

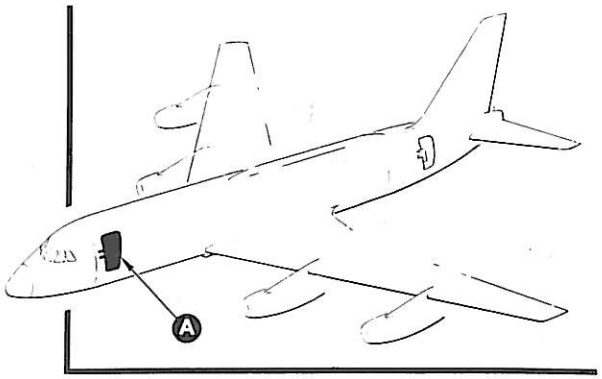
(27) Adjust door microswitch; Refer to 52-6-0.

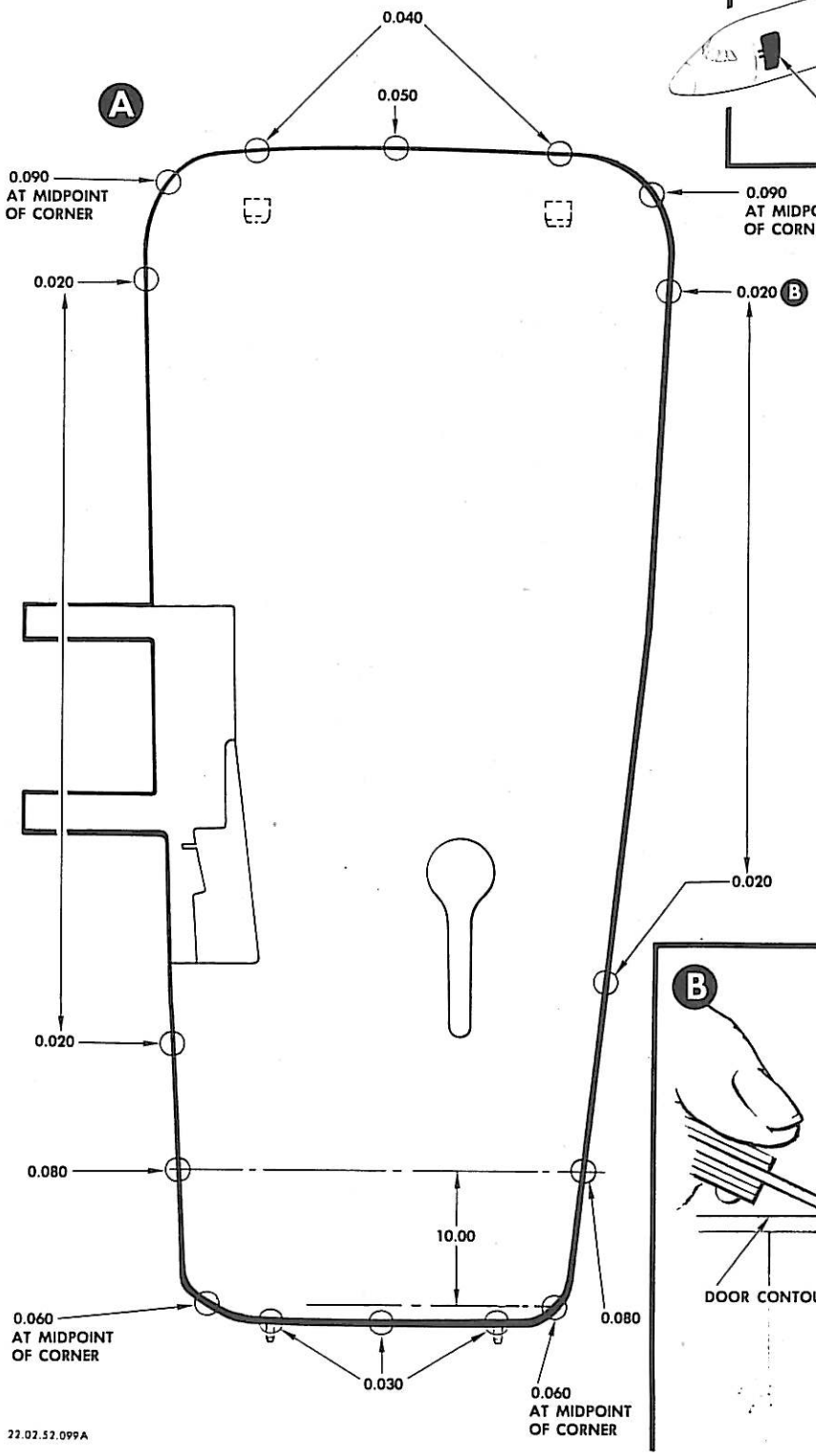
(28) Accomplish door Inspection/Check.

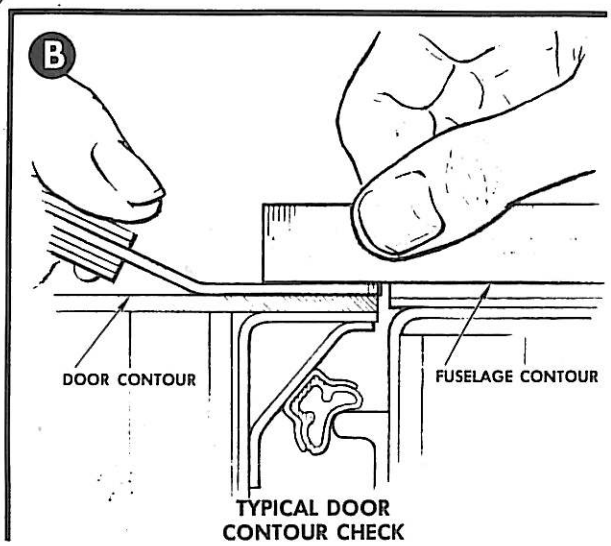
*(29) When door assembly has been replaced with new door, pressurize fuselage cabin to normal operating pressure as directed in Chapter 21, AIR CONDITIONING. Recheck mismatch between door and fuselage skin; refer to Figure 502.

* Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.

NOTE:
1. ALL DIMENSIONS SHOWN ARE BELOW CONTOUR, ±0.030 INCH TOLERANCE
2. AFTER PRESSURIZATION OF CABIN AS DIRECTED IN CHAPTER 21, AIR CONDITIONING, DOOR CONTOUR MUST MATCH FUSELAGE CONTOUR.







TYPICAL DOOR CONTOUR CHECK

FORWARD MAIN ENTRANCE DOOR - INSPECTION/CHECK

1. Inspection/Check Forward Main Entrance Door Assembly

A. Equipment Required - Spring scale or torque wrench with special adapter (Convair TSTO 22-57156) which fits inner handle hub to measure interior door handle operating loads. Spring scale also needed to check door snubber.

B. Procedure.

(1) With door closed, rotate the interior door handle approximately 180 degrees to the OPEN position.

(a) Door shall raise and control handle shall bottom out in the overcenter position.

(b) Door shall remain raised without applying external force.

(2) Rotate door to full open position.

(a) Door shall swing out until hinge stop linkage is fully extended and bottomed. Slowly rotate door to fully open and fully closed positions to determine that door snubber piston is not bottoming at extremes of travel. If proper snubber operation is questionable, check snubber as follows:

Disconnect snubber piston rod end from door hinge.

With snubber piston retracted, apply a constant 51 pound pull to piston rod end with spring scale and record time for piston to travel from fully retracted to fully extended position. Piston travel time should be a minimum of 12 seconds and a maximum of 50 seconds.

(b) Rotate interior door handle toward the closed position. The door interlock mechanism shall prevent handle movement.

CAUTION: IN THE EVENT THE INTERLOCK MECHANISM IS NOT ENGAGED IN THE DOOR HANDLE SHAFT, DO NOT ALLOW DOOR TO LOWER; DAMAGE TO HINGE FAIRING WILL RESULT. REFER TO DOOR ADJUSTMENT/TEST PROCEDURE.

(c) Hold-open hook shall engage in the hinge stop linkage.

(d) Pull edge of door toward the closed position. Hold-open hook shall prevent door closing.

(e) Actuate hold-open hook toward door opening. Hook shall toggle into position freeing the hinge stop linkage for movement.

(3) Rotate door into fuselage opening and slowly rotate the interior door handle to CLOSED position.

CAUTION: WHEN CLOSING DOOR NEVER ALLOW DOOR TO FREE FALL INTO DOOR OPENING; DAMAGE TO DOOR HINGE MECHANISM MAY OCCUR. MANUALLY ASSIST DOOR INTO CLOSED POSITION. DO NOT RESTRAIN DOOR AT INNER HANDLE, BUT ON AFT SIDE OF DOOR INNER SURFACE.

(a) As door lowers, check alignment of the lower door pins and the upper "T" hooks with their respective receptacles as they begin to mesh.

(b) As door reaches the fully closed position, it should bottom on the threshold stops (maximum allowable gap 0.030 inch) and the door handle shall rotate overcenter.

(c) The interlock actuating pin on forward edge of door shall extend below hook on door jamb sufficiently to actuate door-open warning microswitch.

(d) The door-open warning microswitch plunger shall be depressed 0.210 inch maximum when the interlock mechanism actuating pin reaches its fully extended position.

(e) Door seal shall contact striker around entire periphery of door.

(f) For allowable mismatch between door and fuselage skin; refer to Adjustment/Test. Door shall clear fuselage skin 0.060 ($\pm$0.030) inch.

(g) The exterior door handle shall be flush with the exterior skin of door.

(4) Check interior door handle loads with spring scale or torque wrench. Handle load shall not exceed 50 pounds through full range of travel with trim panel removed (70 pounds with trim panel installed).

NOTE: If spring scale is used, load on handle is measured perpendicular to a point on handle centerline 10 inches from center of handle hub, in direction of handle rotation.

(5) Check upper operating cable tension; refer to Adjustment/Test for procedure.

(6) Check lower operating cable tension; refer to Adjustment/Test for procedure.

(7) Repeat steps (1) through (3) (g) except use the exterior door handle.

(8) Rotate the interior door handle to the OPEN position, then rotate the exterior door handle to OPEN position.

(a) At OPEN position the exterior door handle shall engage the interior door handle.

(9) Close door using the exterior door handle.

CAUTION: WHEN CLOSING DOOR NEVER ALLOW DOOR TO FREE FALL INTO DOOR OPENING; DAMAGE TO DOOR HINGE MECHANISM MAY OCCUR. MANUALLY ASSIST DOOR INTO CLOSED POSITION. DO NOT RESTRAIN DOOR AT INNER HANDLE, BUT ON AFT SIDE OF DOOR INNER SURFACE.

REAR MAIN ENTRANCE DOOR - DESCRIPTION AND OPERATION

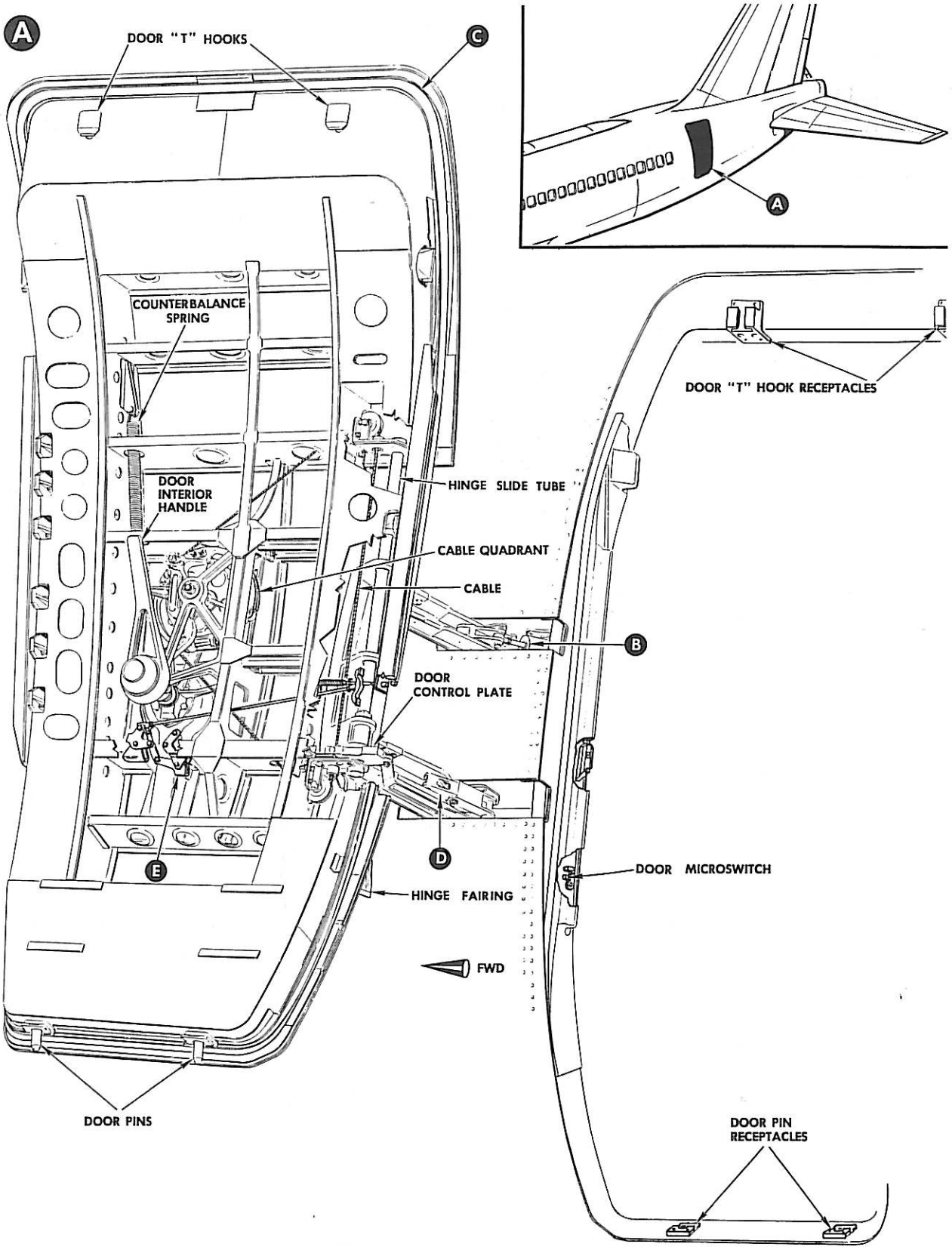
1. General

The rear main entrance door (see Figure 1) is approximately 30 x 74 inches in size and is located on the aft left side of the passenger cabin between fuselage stations 1378 and 1408. It is directly opposite the rear service door and may be opened from either outside or inside the cabin. Sealing around the door is provided by a molded bulb-type wire-reinforced pressure seal which is energized by cabin pressure.

2. Structure

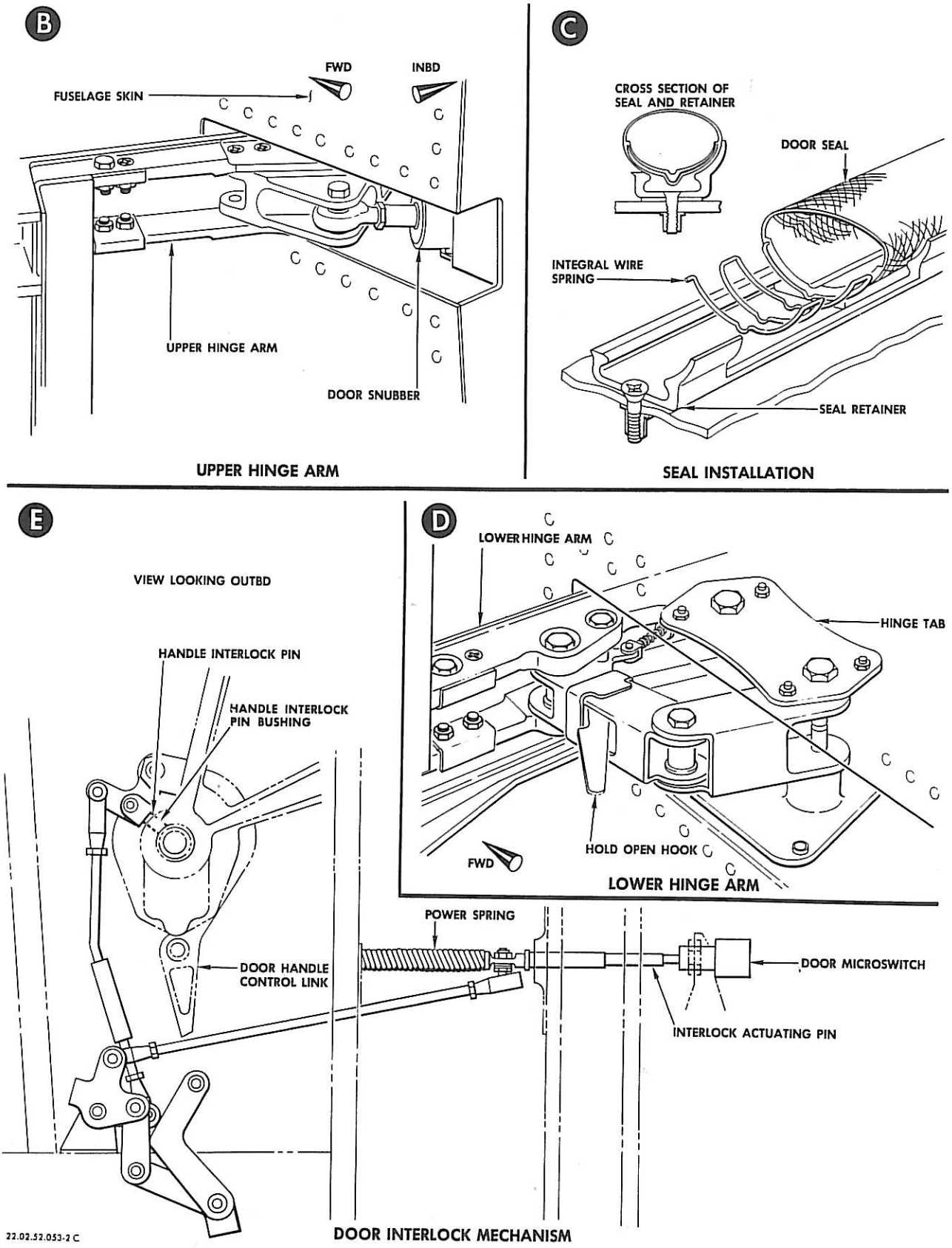
The rear main entrance door structure is of conventional 2024 and 7075 aluminum alloy rib and skin construction that consists of an outside frame with interconnecting horizontal and vertical ribs. The door outer skin is riveted to and forms an integral part of the door frame and rib structure. A partial inner skin encloses part of the rib structure and forms vertical torque boxes along the forward and aft portion of the door and horizontal torque boxes at the top and bottom. The door handles are cast magnesium and the door operating mechanism supports are aluminum alloy castings. The interior surface of the door is covered with an acoustical material, and is trimmed compatible with the decor of the airplane interior.

The continuous main door tracks bolt to the forward and aft edges of the door and mate with tracks in the fuselage structure. Also, a door stub track is located above and offset from, the main door tracks on each side of the door. These stub tracks are fixed and mate with adjustable stub tracks in the upper fuselage door frame structure. Laminated shims are used to adjust the position of the fuselage stub tracks in relation to the door stub tracks. Moly black epoxy top coating has been added to both the main door tracks and the stub tracks for chafe prevention. Refer to Chapter 51, STRUCTURES-GENERAL, for application procedure. Two round door pins are located in the bottom edge of the door, and two "T" hooks are located along the upper edge. An adjustable door stop, positioned by laminated shims, is provided on each of the bottom edge door pins. These stops contact the fuselage threshold and limit vertical travel of the door into the tapered fuselage opening. The "T" hooks on the upper edge of the door mate with receptacles in the fuselage. These receptacles are adjustable inboard and outboard through a serrated horizontal plate. Laminated shims are installed behind the vertical attach leg of these receptacles to compensate for inboard and outboard adjustment. The two round door pins located on the bottom edge of the door mate with receptacles in the fuselage. A stud is installed in each of the receptacles to prevent "spike" heels or other small objects, from becoming lodged in the receptacles.



30.30.52.007-1

Rear Main Entrance Door
Figure 1 (Sheet 1 of 2)


B
FWD
INBD
FUSELAGE SKIN
UPPER HINGE ARM
DOOR SNUBBER
UPPER HINGE ARM
C
CROSS SECTION OF SEAL AND RETAINER
DOOR SEAL
INTEGRAL WIRE SPRING
SEAL RETAINER
SEAL INSTALLATION
E
VIEW LOOKING OUTBD
HANDLE INTERLOCK PIN
HANDLE INTERLOCK PIN BUSHING
DOOR HANDLE CONTROL LINK
POWER SPRING
DOOR MICROSWITCH
INTERLOCK ACTUATING PIN
22.02.52.053-2 C
DOOR INTERLOCK MECHANISM
D
LOWER HINGE ARM
HINGE TAB
HOLD OPEN HOOK
FWD
LOWER HINGE ARM

3. Door Operating Mechanism

The door operating mechanism on the rear main entrance door consists of an exterior and interior door control handle, door handle control link, cable quadrant, door control plate, a counterbalance spring, a flexible operating cable, a hinge slide tube, and articulating hinge linkages. Also included is a door interlock mechanism, a spring-loaded door hold-open hook, a door snubber, and an upper and lower operating cable seal.

The exterior door handle on the rear main entrance door is recessed into the door, flush with the exterior surface of the airplane, and is installed on a coaxial shaft with the interior door handle. The interior door handle operates independently of the exterior door handle; however, operation of the exterior handle results in movement of the interior handle. Door handle rotation is transmitted through the door handle control link to the cable quadrant. Each end of the flexible operating cable attaches to this cable quadrant. A swedged ball near the operating cable midpoint secures the cable in a recess in the door control plate at the door lower hinge arm attachment. This operating cable, being attached to the door control plate and the cable quadrant, provides the effecting means by which the door is raised, lowered, and locked into overcenter positions. The counterbalance spring aids in balancing the door weight as the door is raised, and provides a force for holding the mechanism overcenter in the fully open and closed positions.

The articulating hinge on the door will pivot so as to place the door forward of the door opening and parallel to the fuselage in the full open position. A snubber is mounted at the door upper hinge box and attaches to the door upper hinge arm to dampen the inertia forces of the door opening and closing. The hold-open hook and hinge-stop linkage are located at the door lower hinge arm and prevent the door from inadvertently closing or coming into contact with the fuselage when open.

The door operating mechanism is augmented by an interlock mechanism consisting of an interlock actuating pin on the forward edge of the door, a door handle interlock pin, interlock mechanism actuating lever, power spring, and connecting push-pull rods and bell cranks. When the door is closed and locked, the interlock actuating pin on the forward edge of the door extends below a hook retainer on the forward door jamb. This pin serves as a fail-safe pin which will engage the hook retainer in the event the cinch-down mechanism malfunctions. The interlock actuating pin prevents the door from inadvertently opening; it also actuates the door microswitch to control the associated entrance lighting circuit (refer to Chapter 33, LIGHTS) and the door-open warning light (refer to 52-6-0). The door handle interlock pin latches the handle up when the door is swung out of the opening; it prevents lowering of the door with door in the open position. The door handle control link of the door operating mechanism operates the interlock mechanism actuating lever and in turn sequences operation of the interlock actuating pin on the forward edge of door. The power spring provides an actuating force to operate the interlock actuating pin.

A. Door Mechanism Operation.

A single 180 degree rotation of the exterior or interior door control handle raises the door approximately nine inches to allow the door to be swung open. When opening the door from the outside, the exterior handle must be levered out of its recess before rotation can be initiated. Door handle extraction is first accomplished by depressing one end of a small lever in the handle. This action provides a projecting lever which may be gripped with the fingers. The door handle may then be pulled sufficiently from its recess to permit grasping the door handle with the other hand. Pulling the exterior handle outboard engages a driving dog on the exterior door handle shaft with the interior door handle shaft and after initial rotation of the door handle, an outward pull is no longer necessary. The first 10 degrees of handle motion takes the door operating mechanism out of the overcenter configuration and retracts the interlock mechanism actuating pin on forward edge of door. The door microswitch located forward of the door opening in the fuselage structure deactuates and illuminates a warning light. Further rotation of the door control handle causes the door to rise, disengaging the upper door "T" hooks and the lower door pins that secure the door in the closed position.

At the completion of the nine-inch vertical travel (180 degrees of control handle rotation), the door tracks will clear the fuselage tracks thus permitting the door to be pivoted outboard around the articulating hinge on the forward edge of the door. The overcenter action of the door operating mechanism will hold the door in the raised position. As the door is opened outward the interlock mechanism locks the door control handle shaft to prevent lowering of the door. The articulating hinge changes the pivot points of the door as it rotates to the full open position thus placing the door forward of the opening and parallel to the fuselage. An interior assist handle is also provided on the door as an aid in the physical operation of the door. Guidance of the door is not required as this is accomplished by the hinge mechanism.

A snubber at the door upper hinge arm dampens the inertia forces of the door when opening and closing. This snubber operates only during motion of the hinge and becomes increasingly more effective as the hinge approaches the fully open or fully closed position. The door is restrained in the full open position by the hinge stop linkage on the door lower hinge arm which is locked with the hold-open hook. This hook need not be held for position as it is spring-loaded and has a snap action.

Closing the door is accomplished by reversing the door opening procedure; however, the hold-open hook must be manually released when closing the door. It is finger operated in a direction toward the fuselage. In the event the door handles are not engaged with each other when

accomplishing the door closing cycle (when operating the door mechanism from the outside), the exterior handle can be rotated 360 degrees until the driving dog re-engages the mating recess of the interior handle shaft. Engagement can only occur when the handles are in phase with each other due to the offset of the driver and mating recess from the door handle shaft centerline.

4. Seal

A bulb-type seal, (see Figure 1) energized by cabin pressure, is employed between the door and the door frame. Vent holes are provided in the inboard or pressurized side of this seal. Cabin pressure passes through these holes and forces the crown of the seal against the seal striker around the door opening.

The seal is constructed of tear-resistant silicone rubber, reinforced with Dacron fabric and contains an inner and outer pressure wall. The dual wall construction is a fail-safe feature to preclude loss of pressurization in the event of unforeseen damage to the outer pressure wall. The seal wall is also reinforced with a flexible spring steel wire, integrally molded within the seal, to eliminate the possibility of seal collapse. The internal spring wire supports the side walls of the seal against lateral pressure loads, when pressurized, to assure positive alignment with the fuselage striker. The seal is vulcanized as a single unit to fit the seal retainer around the periphery of the door.

The seal retainer is screwfastened and riveted around the inside periphery of the door. The retainer consists of a formed section with two protruding lips along each side of its inner surface, near the base. These lips fit over the molded flanges along each side of the seal and restrain the seal in position.

5. Drainage Provisions

A. Hinge Structural Box Drain.

There are two nylon drain tubes installed to the upper and lower structural hinge boxes for moisture drainage. One drain tube is installed between the upper and lower hinge boxes to drain moisture from the upper hinge box into the lower hinge box. Another drain tube is installed to the bottom of the lower hinge box to a drain outlet in the fuselage skin.

B. Door Pin Receptacle Drain (Lower Shear Pins).

A cup is installed on the underside of each door pin receptacle to collect liquids and debris that may pass through the door pin hole. Clamped to the bottom of the cup is a flexible low pressure hose which in turn clamps to a drain outlet in the fuselage skin.

REAR MAIN ENTRANCE DOOR - TROUBLE SHOOTING

POSSIBLE CAUSE	ISOLATION PROCEDURE AND CORRECTION
1. DOOR DOES NOT OPERATE WITH HANDLE MOTION	
A. Sheared pin at attachment of door handle control link to fork on door interior handle shaft.	Replace pin.
B. Broken door operating cable.	Replace cable.
C. Cable midpoint ball out of slide tube control plate.	Replace cable midpoint ball in slide tube control plate, and safety wire.
2. DOOR HANDLE OPERATING LOADS EXCESSIVELY HIGH	
A. Operating cable tension too high.	Readjust cable tension; refer to door Adjustment/Test procedure.
B. Door binding in fuselage opening.	Accomplish door Adjustment/Test procedure.
C. Interlock pin bushing partially out of door handle housing hub.	Remove door interlock mechanism access hole cover from inside surface of door trim panel or remove entire trim panel refer to Chapter 25, EQUIPMENT/ FURNISHINGS. Push bushing into handle housing hub to free interlock mechanism. Incorporate bushing retainer clip on bushing at earliest opportunity; refer to 52-1-0, CABIN EXTERIOR DOORS Approved Repairs.
D. Burrs on door tracks or daggers.	Remove burrs, refer to Structural Repair Manual for Door Track Allowable Damage Limits.
3. DOOR OPERATING MECHANISM WILL NOT LOCK OVERCENTER IN DOOR FULLY RAISED AND LOWERED POSITIONS	
A. Operating cable tension too low.	Readjust cable tension; refer to door Adjustment/Test procedure.
B. Broken counterbalance spring.	Replace counterbalance spring.

POSSIBLE CAUSE	ISOLATION PROCEDURE AND CORRECTION
4. HINGE FAIRING DOES NOT FAIR IN WITH FUSELAGE CONTOUR	
A. Nylon hinge fairing stop broken or out of adjustment.	Replace or adjust hinge stop; refer to door Adjustment/Test procedure.
B. Bent or broken hinge fairing link.	Replace hinge fairing link.
5. INTERIOR AND EXTERIOR DOOR HANDLES NOT SYNCHRONIZED; INTERIOR HANDLE PROJECTS INBOARD APPROXIMATELY 0.75 INCH	
A. Service door interior door handle shaft installed in main entrance door.	Install proper shaft.
6. DOOR-OPEN WARNING LIGHT DOES NOT FUNCTION PROPERLY	
A. Circuit or light bulb malfunction.	Refer to DOOR-OPEN WARNING SYSTEM TROUBLE SHOOTING, Section 52-6-0.
7. INTERLOCK ACTUATING PIN, ON FORWARD EDGE OF DOOR IS NOT WITHDRAWING TO CLEAR HOOK RETAINER WHICH IS IMMEDIATELY ABOVE MICROSWITCH PLUNGER ON DOOR FORWARD JAMB--DOOR EITHER STOPS APPROXIMATELY TWO INCHES FROM CLOSING OR CANNOT BE OPENED WITH HANDLE MOTION	
A. Interlock actuating pin mechanism out of adjustment.	Adjust interlock actuating mechanism; refer to Adjustment/Test.
8. DOOR EXCEEDINGLY HARD TO OPEN OR CLOSE, ESPECIALLY IN THE HALF-WAY OPEN OR HALF-WAY CLOSED POSITION	
A. Broken snubber-to-door attachment bolt.	Replace snubber-to-door attachment bolt.
B. Snubber out of adjustment.	Adjust snubber; refer to Adjustment/Test procedure.
9. DOOR BINDS, CAUSING EXCESSIVE HANDLE LOAD; WILL NOT RAISE OR LOWER THE FULL AMOUNT OF TRAVEL	
A. Bent slide tube.	Replace slide tube.
10. FUSELAGE TRACKS AND DOOR TRACKS DO NOT PROPERLY MATE WHEN CLOSING DOOR	
A. Allowing door to free fall into closed position.	Manually assist door into closed position. Do not restrain door at inner handle, but on aft side of door inner surface.

POSSIBLE CAUSE	ISOLATION PROCEDURE AND CORRECTION
11. DOOR JAMMED IN THE CLOSED POSITION	
A. Top edge of door skin damaged and caught on edge of fuselage skin.	Insert a thin piece of sheet metal, approximately two feet long, between door skin and fuselage skin. Sheet metal to act as a sliding surface which will prevent skin interference when door rises. Open door; reshape door skin and fuselage skin to proper contour.
12. EXTERIOR DOOR HANDLE LOOSE	
A. Large coil spring broken inside interior door handle assembly.	Replace large coil spring.
13. EXTERIOR DOOR HANDLE ROTATES BUT WILL NOT ENGAGE TO RAISE DOOR	
A. Large coil spring broken inside interior door handle assembly.	Replace large coil spring.
14. DOOR LOOSE IN OPEN POSITION	
A. Due to continuous operation of door, dimension of 0.005 to 0.020-inch between the slide tube control plate and titanium rub strips has become excessive.	Add shims, as required, between the titanium rub strips and door structure to maintain the 0.005 to 0.020-inch dimension between the slide tube control plate and titanium rub strips.

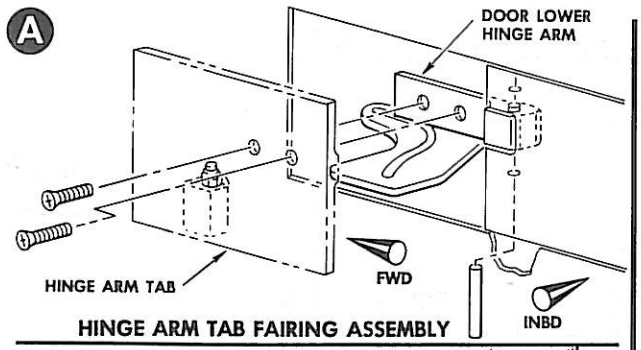
REAR MAIN ENTRANCE DOOR - REMOVAL/INSTALLATION

1. Removal/Installation Rear Main Entrance Door (see Figure 401)

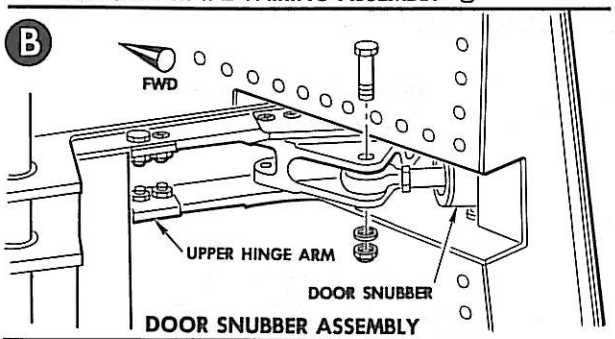
A. Equipment Required - None.

B. Remove Rear Main Entrance Door.

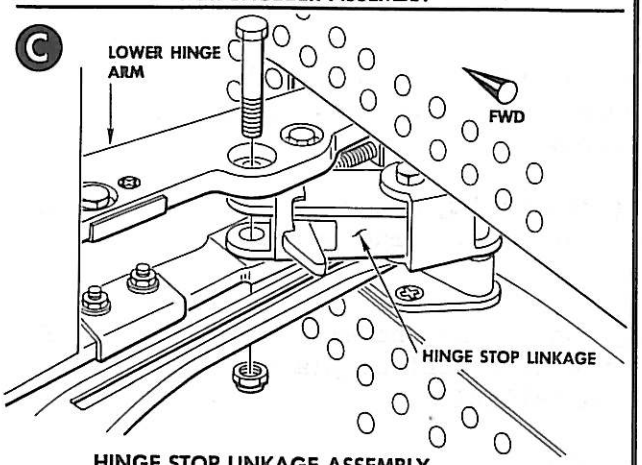
	Figure Detail
(1) Remove two screws securing the lower hinge arm tab fairing on the forward end of the door lower hinge arm. (Bag and tag screws for installation)	D
(2) Remove tab fairing, disconnecting tab eccentric adjustment bolt from grooved track in lower fuselage hinge box. (Tag for installation.)	
(3) Rotate door to open position.	
(4) Remove trim and necessary insulation to gain access to the hinge attach bolts. (Refer to Chapter 25, EQUIPMENT/ FURNISHINGS.)	
(5) Remove nut, washer, bolt, and bushing connecting rod end of door snubber to the door upper hinge arm. (Bag and tag loose parts for installation.)	A
(6) Remove nut, bolt, and bushing connecting hinge stop linkage to the lower hinge arm of door. (Bag and tag loose parts for installation.)	E
(7) Remove nut, bolt, and bushing connecting the articulating hinge control link to the door control plate. (Bag and tag loose parts for installation.)	F
(8) Provide adequate support for door.	
(9) Remove nut from upper and lower hinge arm attach bolts at the fuselage hinge boxes. (Bag and tag nuts for installation)	B & C
(10) Remove the lower hinge arm attach bolt. (Bag and tag bolt for installation.)	C
(11) Remove the upper hinge arm attach bolt. (Bag and tag bolt for installation.)	B
(12) Slide hinge arms out of the fuselage hinge boxes; retain washers and bushings used at hinge connection to the fuselage. (Bag and tag washers and bushings for installation.)	



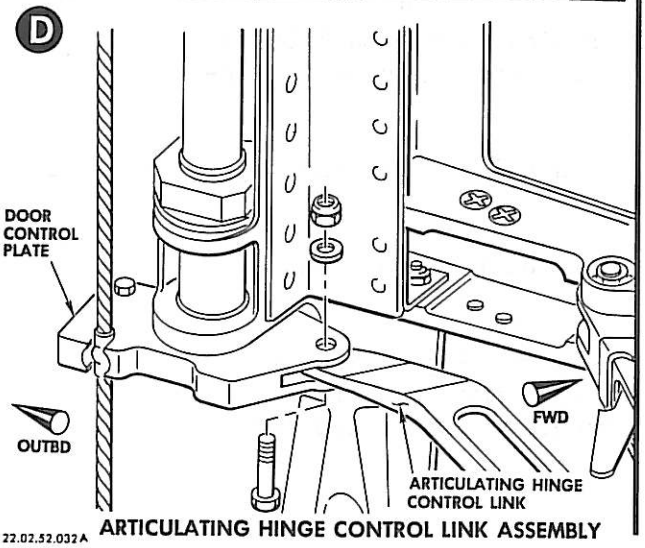
HINGE ARM TAB FAIRING ASSEMBLY



DOOR SNUBBER ASSEMBLY

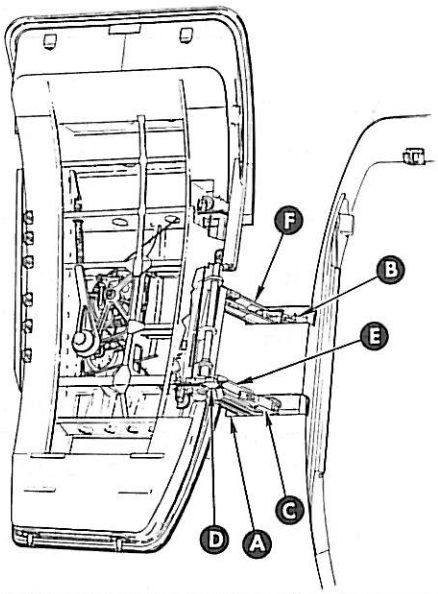


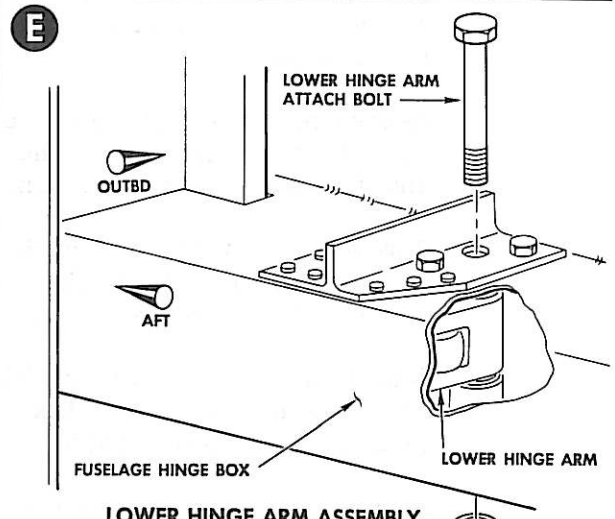
HINGE STOP LINKAGE ASSEMBLY



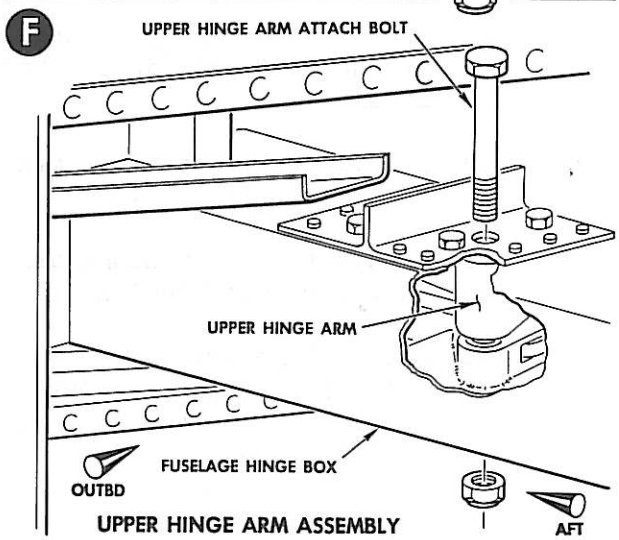
22.02.52.032A

ARTICULATING HINGE CONTROL LINK ASSEMBLY





LOWER HINGE ARM ASSEMBLY



UPPER HINGE ARM ASSEMBLY

Figure Detail

(13) Remove door from fuselage.

NOTE: Examine coating on door tracks. Repair (or replace) coating if it is worn sufficiently to expose bare metal. Refer to Chapter 51, STRUCTURES-GENERAL, for application procedure. By accomplishing this on door removal, time will be gained to allow coating to cure before reinstalling door.

C. Install Rear Main Entrance Door.

(1) Support rear main entrance door so hinge arms align with fuselage hinge boxes.

(2) Insert bushings in the door hinge pivot fittings of the upper and lower hinge arms. — B & C

(3) Align hinge with attach holes in the fuselage hinge boxes.

(4) Install a washer between hinge bushing and the fuselage hinge box, above and below each door hinge arm.

(5) Insert upper and lower hinge attach bolts through the fuselage hinge boxes, door hinge arms, bushings, and washers; install nuts.

(6) Insert bushing in the articulating hinge control link and align bushing with attach hole in the door control plate. — F

(7) Install bolt and nut connecting the articulating hinge control link to the door control plate.

(8) Insert bushing in door hinge stop linkage and align with stop linkage attach hole in the lower door hinge arm. — E

(9) Install bolt and nut connecting stop linkage to the hinge arm.

(10) Insert bushing in rod end of door snubber and align with snubber attach hole in the upper door hinge arm. — A

(11) Install bolt, washer, and nut connecting snubber to the upper hinge arm of door.

NOTE: Postpone the lower hinge arm tab installation and adjustment until door adjustment/test procedure is accomplished. — D

(12) Accomplish rear main entrance door adjustment/test procedure.

2. Removal/Installation Rear Main Entrance Door Hinge (see Figure 402)

Figure Detail

A. Equipment Required.

(1) Torque wrench calibrated in inch-pounds.

(2) Grease, Specification MIL-G-7421.

WARNING: ENSURE AGAINST DOOR HANDLE BEING MOVED INADVERTENTLY. IF HANDLE IS NOT HELD AS IT MOVES OVER CENTER, IT IS DANGEROUS AS THE COUNTERBALANCE SPRING MOVES WITH A FORCE IN EXCESS OF 70 POUNDS.

B. Remove Rear Main Entrance Door Hinge.

NOTE: Bag and tag loose parts for ease of reinstallation.

(1) Remove door assembly from airplane. (Refer to Removal/Installation Rear Main Entrance Door.)

(2) Remove door interior control handle. (Refer to 52-1-0.)

(3) Remove door interior trim and necessary soundproofing. (Refer to Chapter 25, EQUIPMENT/FURNISHINGS.)

(4) Remove the slide tube bracket access doors on the forward interior surface of the door.

(5) Loosen nuts on cable hooks at the cable quadrant and disconnect cables. — A

(6) Remove nut and bolt securing slide tube to the upper slide tube bracket. — B

(7) At each slide tube bracket remove bolts, washers, and nuts securing brackets to the door structure; remove laminated shims. — B

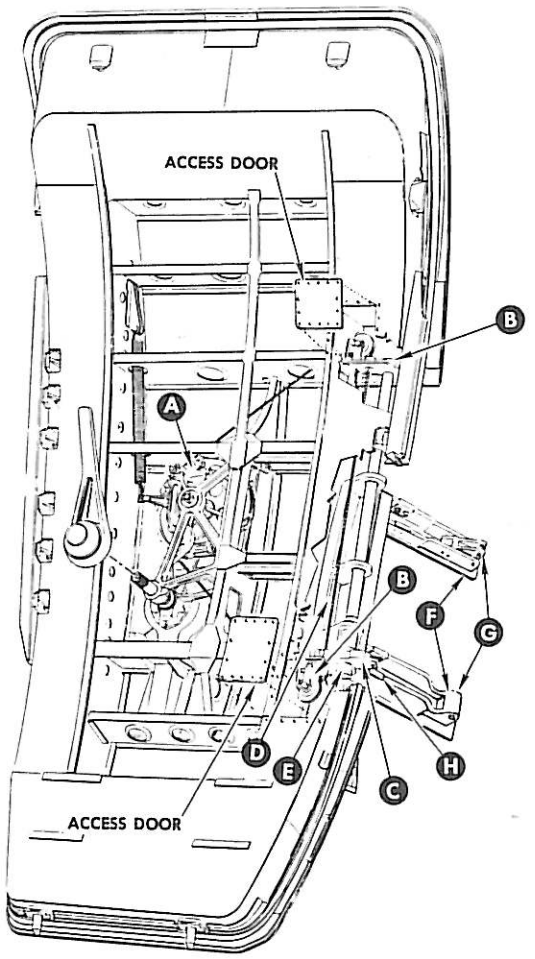
(8) Slide the slide tube brackets off each end of the slide tube.

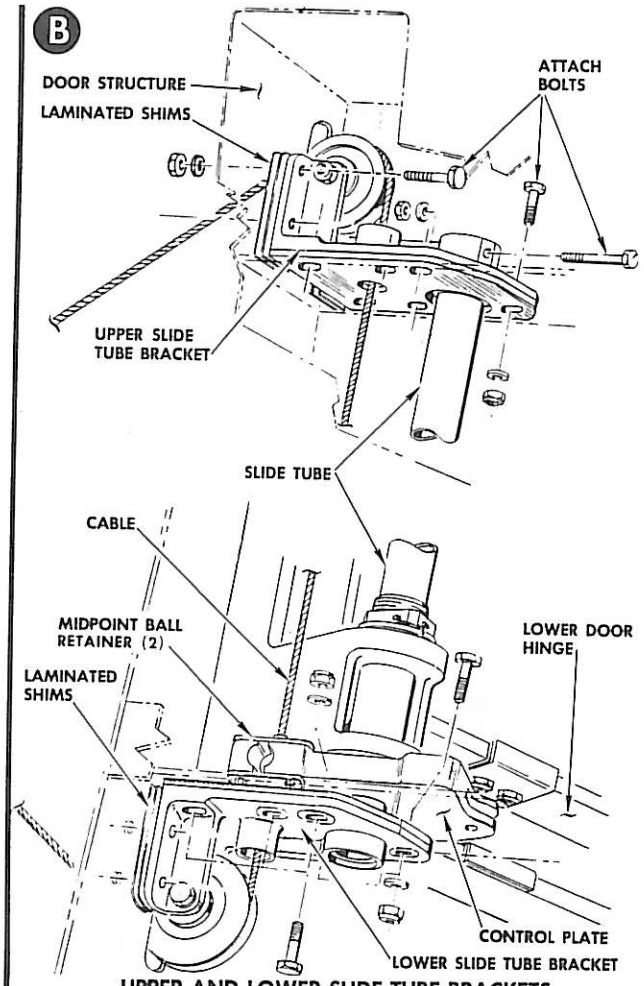
(9) Remove cable midpoint ball retainers or safety wire from door control plate, remove cable midpoint ball from slot in door control plate. — C

(10) Remove door hinge and slide tube from the door.

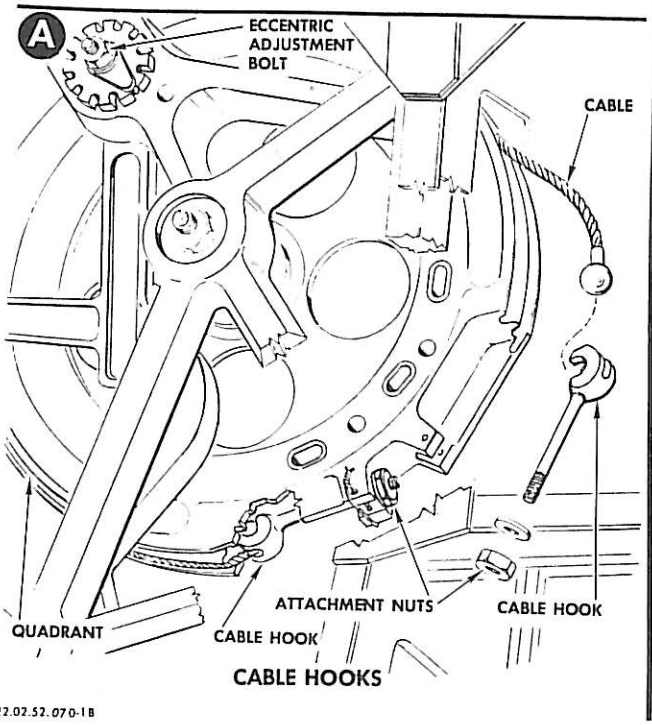
(11) Remove slide tube from the door hinge arm fittings. — D

(12) Remove cotter pin, washer, and pin attaching hinge fairing link to the door control plate.

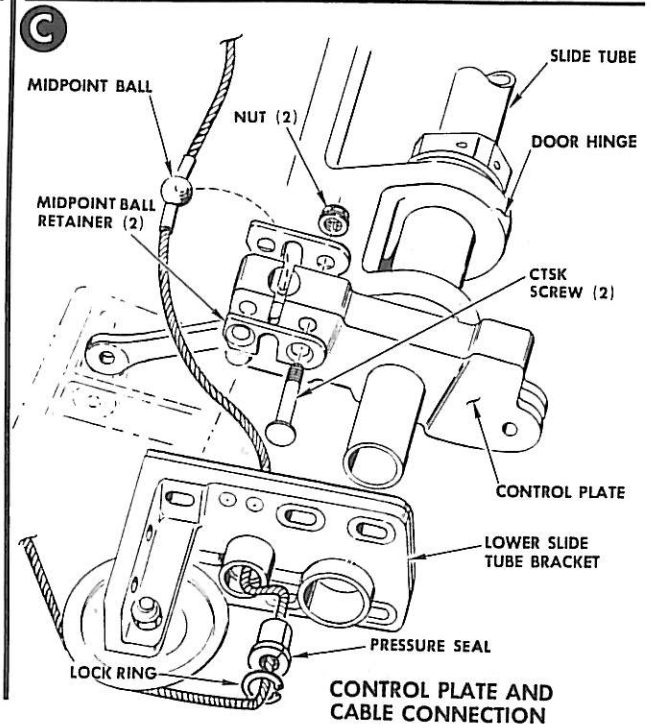




UPPER AND LOWER SLIDE TUBE BRACKETS

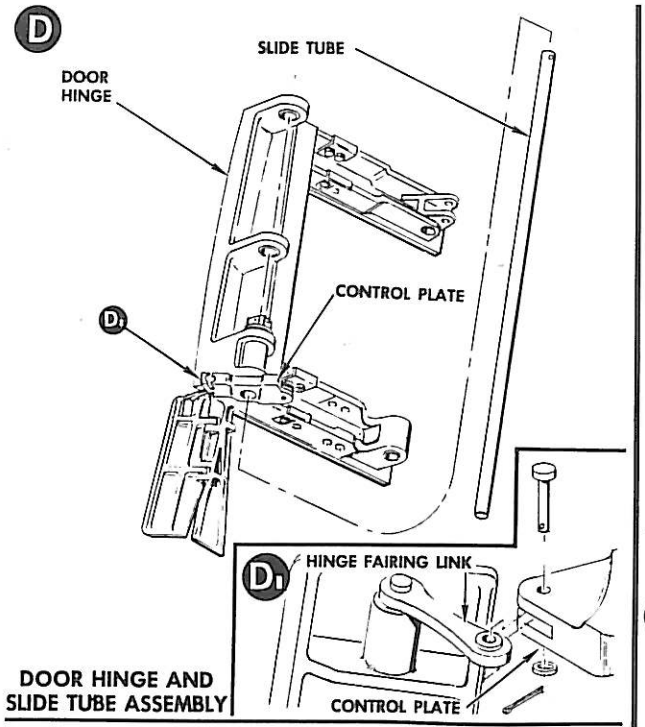


CABLE HOOKS

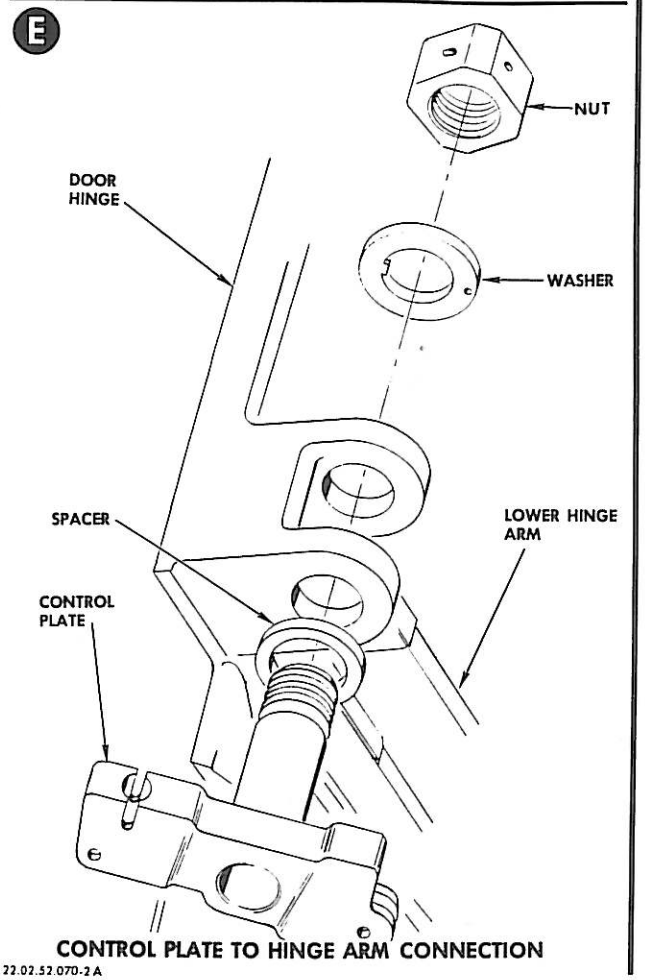


CONTROL PLATE AND CABLE CONNECTION

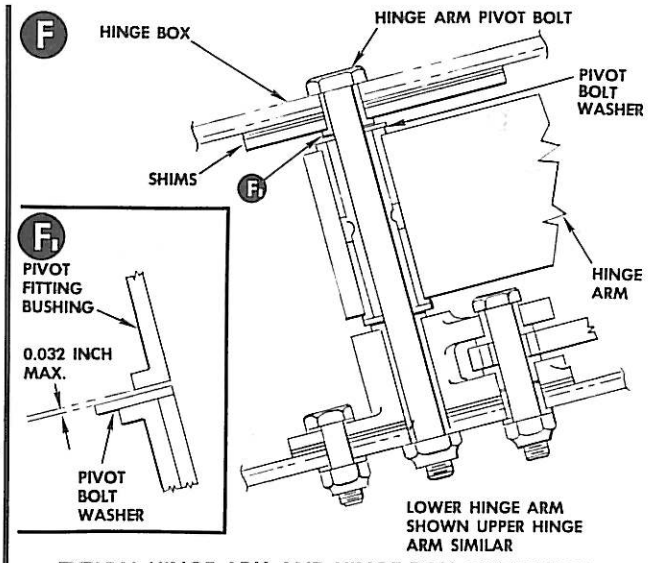
22.02.52.070-1B



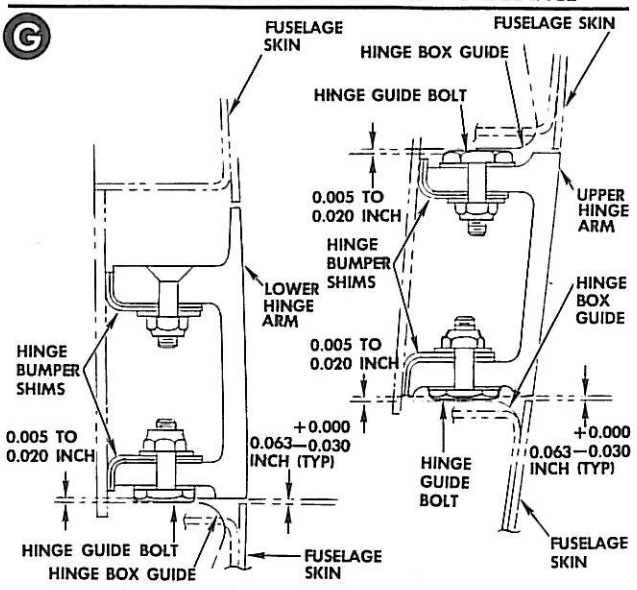
DOOR HINGE AND SLIDE TUBE ASSEMBLY



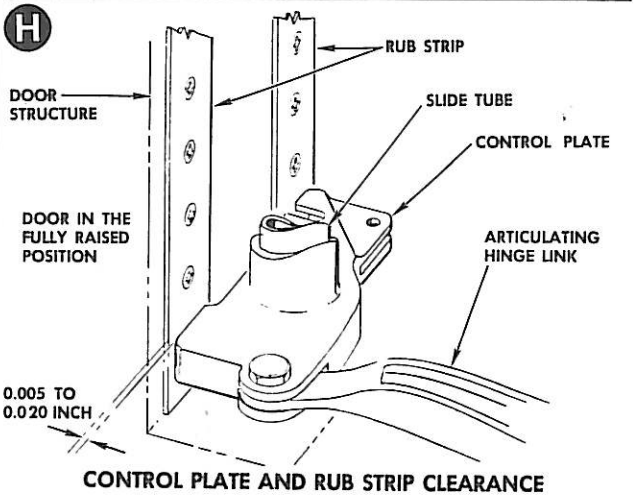
CONTROL PLATE TO HINGE ARM CONNECTION



TYPICAL HINGE ARM AND HINGE BOX CLEARANCE



HINGE GUIDE BOLT AND HINGE BOX GUIDE CLEARANCE



CONTROL PLATE AND RUB STRIP CLEARANCE

22.02.52.070-2 A

Figure Detail

(13) Cut lockwire and remove nut, washer, and spacer securing door control plate to the door lower hinge arm; remove door control plate. — E

C. Install Rear Main Entrance Door Hinge.

NOTE: Steps (1) through (4) apply to installation of a new door hinge, or replacement of the hinge arm pivot fittings within the fuselage hinge boxes. These steps may be omitted if the original hinge and hinge arm pivot fittings are being reinstalled.

(1) With door removed from hinge, temporarily install door hinge in the fuselage hinge boxes. (Refer to Removal/Installation Rear Main Entrance Door Assembly, steps C.(1) through C.(5).)

(2) Rotate door assembly to the open position.

(a) Measure clearance between the upper hinge arm pivot fitting and pivot bolt washer at each fuselage hinge box. Clearance shall be 0.032 inch maximum. — F

(b) Add or remove shims between the hinge arm pivot fittings and the fuselage hinge boxes to obtain proper clearance.

(3) Rotate door hinge to the closed position

(a) Add or remove washers under heads of the hinge guide bolts to obtain 0.005 to 0.020-inch clearance between bolthead and the fuselage hinge box guides. — G

(b) If necessary trim the fuselage hinge box guides to obtain correct clearance.

(c) Remove or add hinge bumper shims as required to make hinge fair in with fuselage in the door-closed position.

NOTE: There shall be a minimum of one shim installed at each bumper location.

(d) Clearance between hinge arms and the fuselage skin shall be 0.063 (+0.000, -0.030) inch. Trim hinge as required.

(4) Remove door hinge from the fuselage hinge boxes.

Figure Detail

(5) Insert shank of door control plate through lower hinge arm fitting with threaded end towards the upper hinge arm. — E

(a) Install spacer, washer, and nut.

(b) Torque nut 10 to 20 inch-pounds.

(6) Install pin, washer, and cotter pin connecting hinge fairing link to the door control plate. — D

(7) Lubricate slide tube with specified grease. Insert slide tube through the hinge arm fittings, with bolt hole at the top.

(8) Position door hinge and slide tube in door.

(9) Engage midpoint ball of operating cable in the door control plate slot and install cable midpoint ball retainers, if available, or safety wire. — C

NOTE: Longest section of the cable, measured from the midpoint ball, routes through the upper cable pulley.

(10) Install the slide tube brackets on each end of the slide tube. — B

NOTE: To facilitate adjustment, do not install shims behind vertical attach legs of the slide tube brackets until door adjustment/test procedure is accomplished.

(11) Install bolt and nut securing slide tube to the upper slide tube bracket.

(12) Connect cable ends to cable quadrant. Safetywire cable hooks in hook slots of quadrant.

(13) Temporarily reinstall the door interior control handle. (Refer to 52-1-0.)

(14) With the door control handle in the open position, check clearance between the lower surface of the door control plate and top of the bolt retainers in the bottom of the slide tube well.

(a) Control plate shall clear bolt retainers. Adjust cable hooks to provide this clearance.

Figure
Detail

(b) Tighten cable hook nuts sufficiently to remove all slack in the operating cable.

(15) Check clearance between edge of the door control plate and rub strips inside of the slide tube well for full distance of travel.

NOTE: The interlock mechanism actuating pin on the forward edge of door must be manually actuated in order to operate door mechanism.

(a) Minimum permissible clearance is 0.005 inch through full travel. The last one inch travel to the full up position shall be within 0.005 to 0.020 inch. H

(b) Add or remove shims behind rub strips to obtain proper clearance.

(16) Install door assembly on airplane. (Refer to Removal/Installation Rear Main Entrance Door.)

3. Removal/Installation Door Pin Receptacle Drain Cup (see Figure 403)

A. Equipment Required - None.

B. Remove Door Pin Receptacle Drain Cup.

(1) Remove tread plate and carpet on floor panel inboard of door threshold. (Refer to Chapter 25, EQUIPMENT/FURNISHINGS.)

(2) Remove floor panel inboard of door threshold.

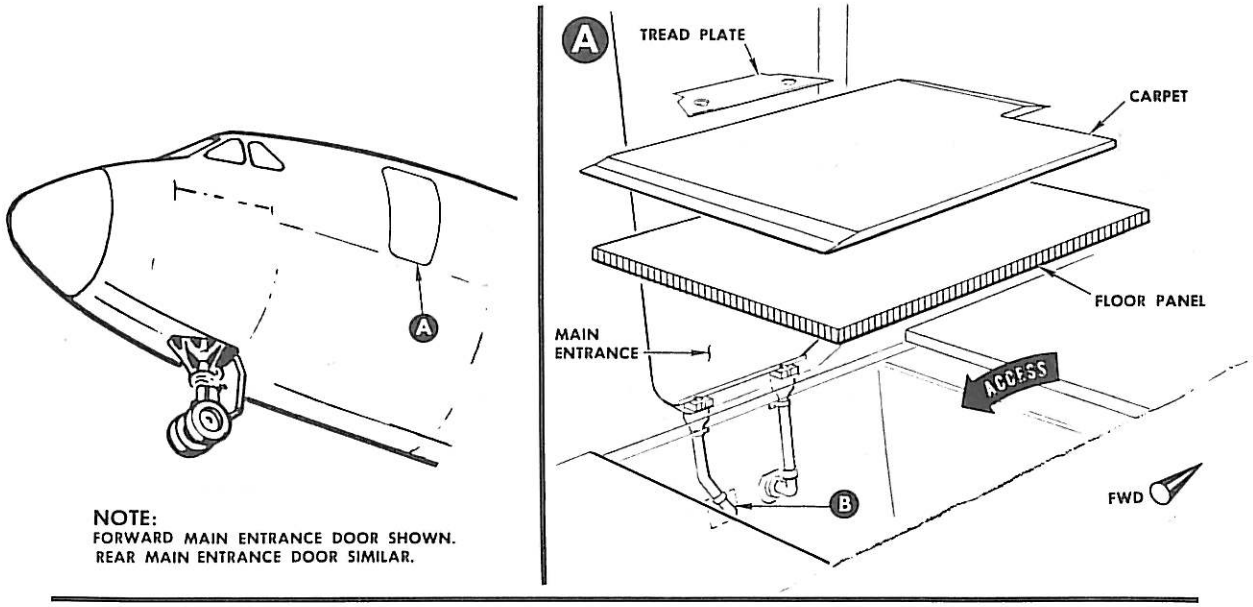
(3) Remove clamp attaching drain hose to bottom of drain cup; remove cup.

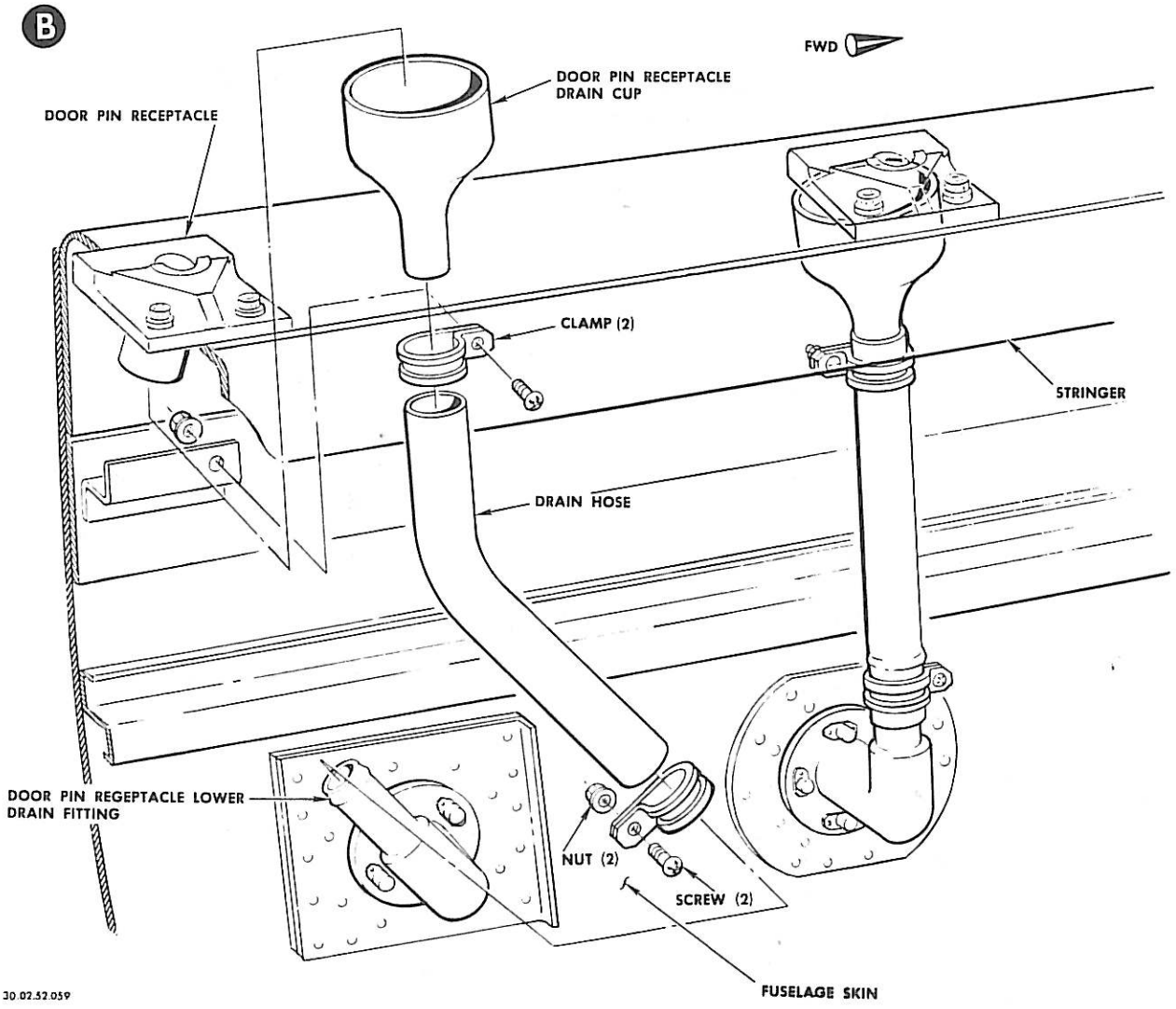
C. Install Door Pin Receptacle Drain Cup.

(1) Slide drain hose over lower end of drain cup and install clamp.

(2) Install floor panel inboard of door threshold.

(3) Install carpet and tread plate inboard of door threshold. (Refer to Chapter 25, EQUIPMENT/FURNISHINGS.)





Main Entrance Door Pin Receptacle Drain Cup Installation
Figure 403

REAR MAIN ENTRANCE DOOR - ADJUSTMENT/TEST

1. Adjustment/Test Rear Main Entrance Door (see Figure 501)

NOTE: All of the following steps apply after installation of a new door, new hinge, or reinstallation of a door where slide tube, pulley brackets, or door hinge have been removed or disturbed. On door adjustments where slide tube, pulley brackets, or door hinge have not been removed or disturbed, the steps marked by an asterisk * need not be accomplished.

A. Equipment Required:

(1) Calibrated cable tensiometer capable of measuring tension loads of 270 to 770 pounds.

(2) Spring scale or torque wrench with special adapter (Convair TSTO 22-57156, which fits over the inner handle hub).

B. Adjust Rear Main Entrance Door.

CAUTION: WHEN CLOSING DOOR NEVER ALLOW DOOR TO FREE FALL INTO DOOR OPENING; DAMAGE TO DOOR HINGE MECHANISM MAY OCCUR. MANUALLY ASSIST DOOR INTO CLOSED POSITION. DO NOT RESTRAIN DOOR AT INNER HANDLE, BUT ON AFT SIDE OF DOOR INNER SURFACE.

(1) Slowly swing door outward and forward until the door hinge-stop linkage bottoms out.

NOTE: When the door hinge-stop linkage bottoms out the door hold-open hook should engage stop linkage.

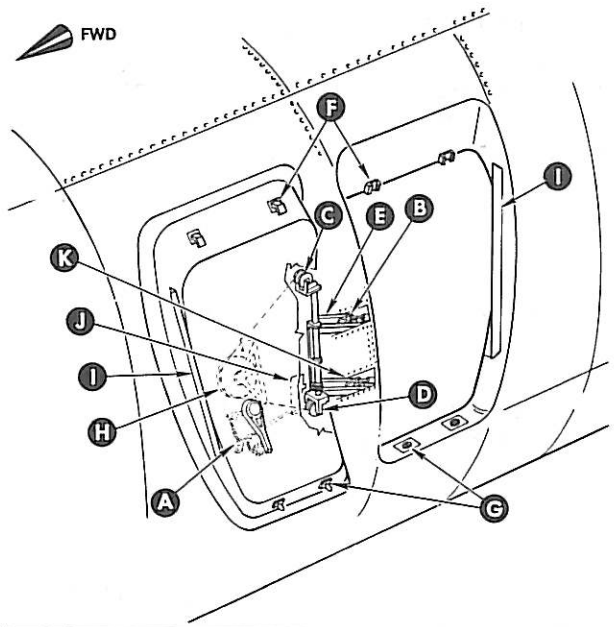
(a) Move door aft until hinge is near midpoint of full travel. Loosen jam nut on snubber piston shaft and rotate shaft to lengthen, until retracted snubber piston is felt to bottom, while moving door gently about midpoint of travel. Shorten snubber piston shaft by rotating one full turn; retighten jam nut. Slowly rotate door to fully opened and fully closed positions to determine that snubber is not bottoming at extremes of travel.

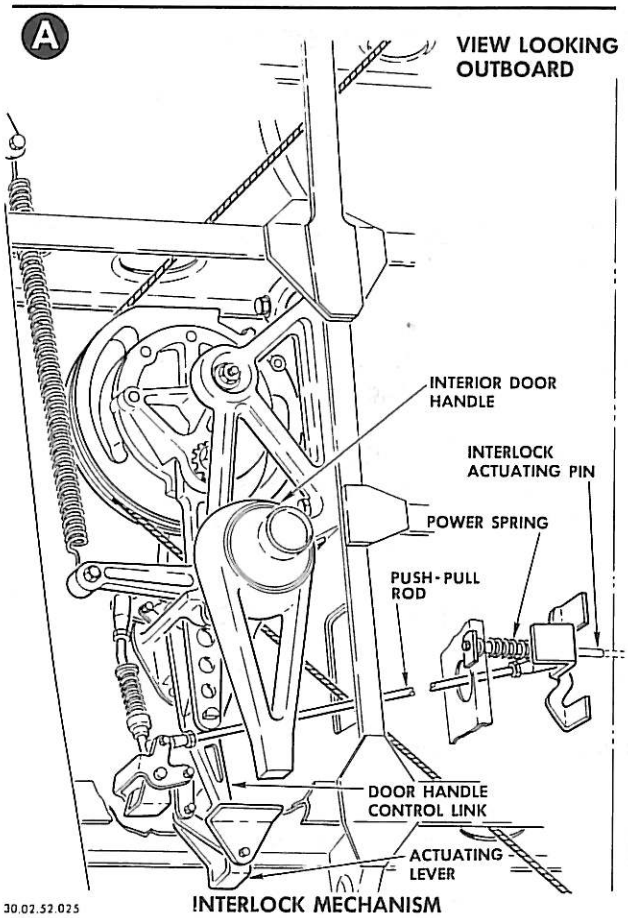
(2) Check the exterior door handle fair-in; refer to 52-1-0.

(3) Remove the interior door control handles; refer to 52-1-0.

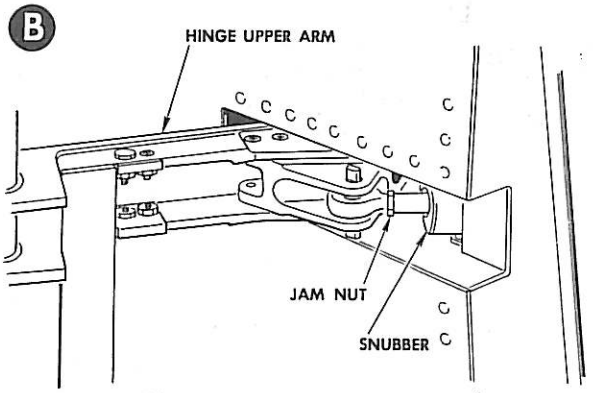
(4) Remove interior trim and necessary soundproofing as directed in Chapter 25, EQUIPMENT/FURNISHINGS.

(5) Temporarily reinstall interior door handle to accomplish door adjustments.

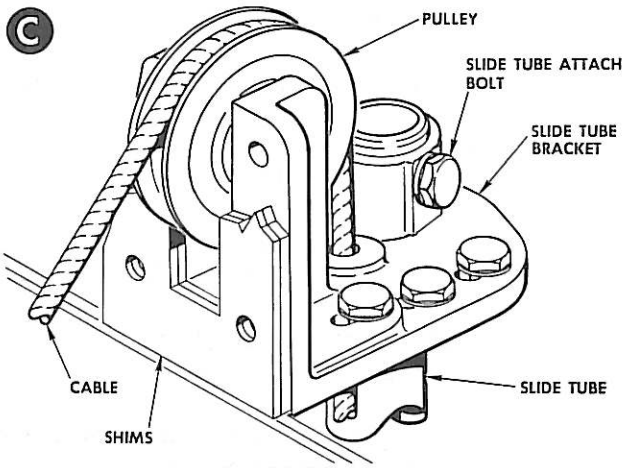




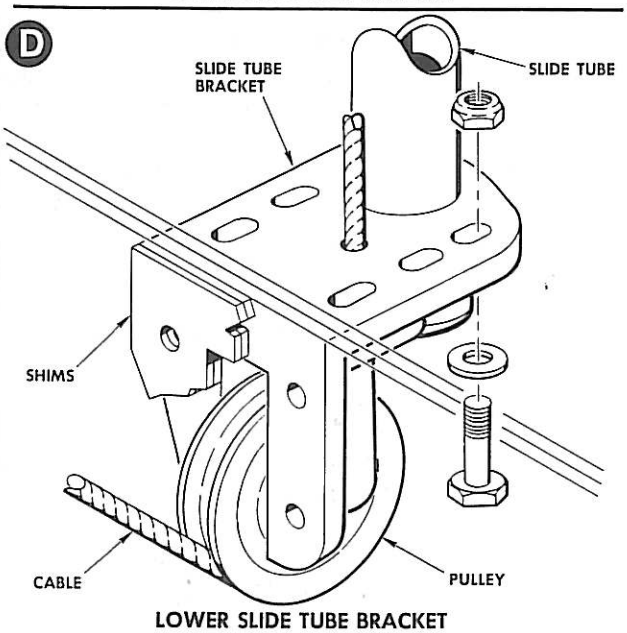
INTERLOCK MECHANISM



UPPER HINGE ARM AND SNUBBER

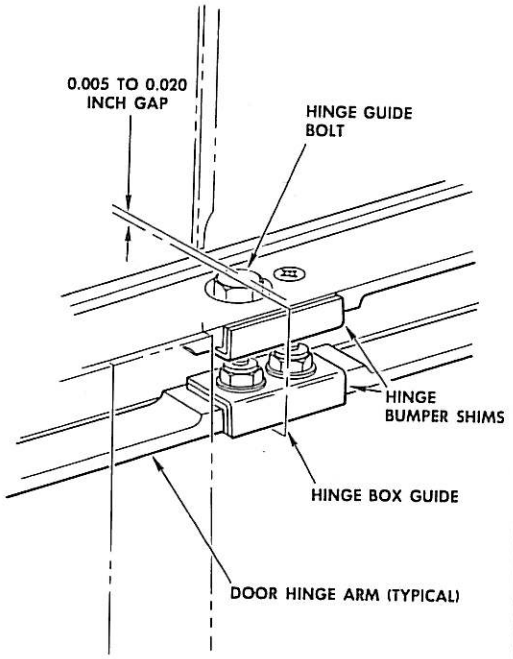


UPPER SLIDE TUBE BRACKET



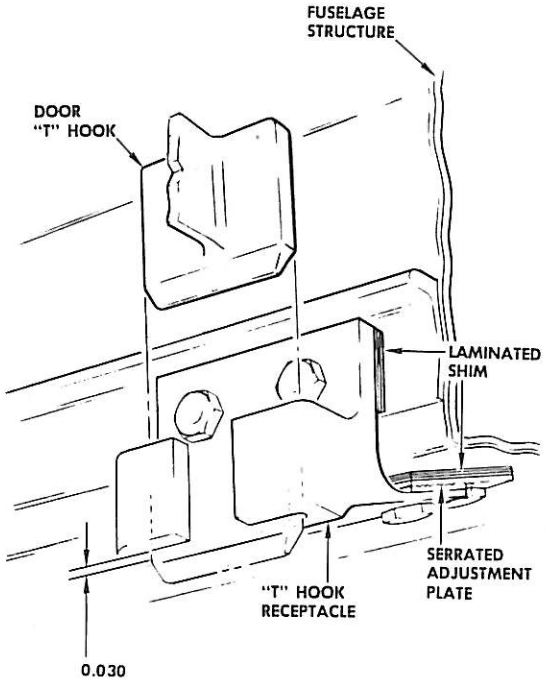
LOWER SLIDE TUBE BRACKET

E



HINGE ARM-TO-HINGE BOX GUIDE CLEARANCE

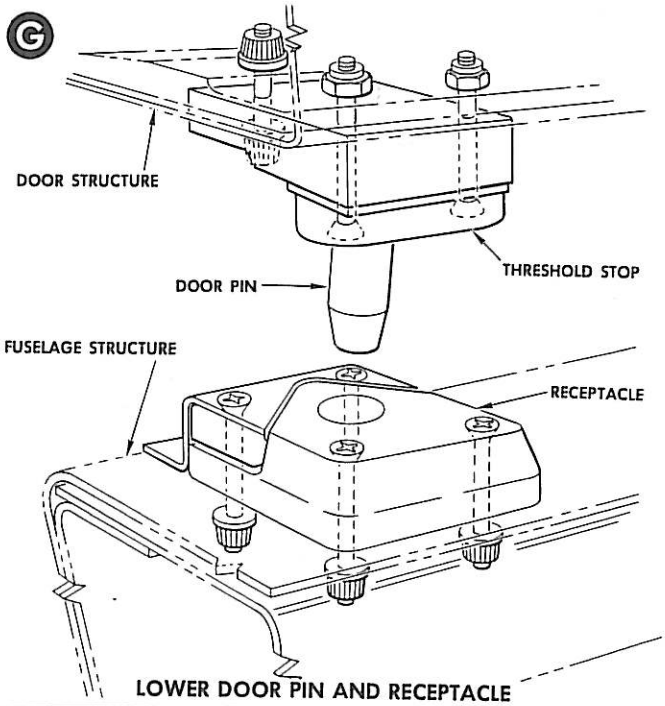
F



DOOR UPPER "T" HOOK AND RECEPTACLE

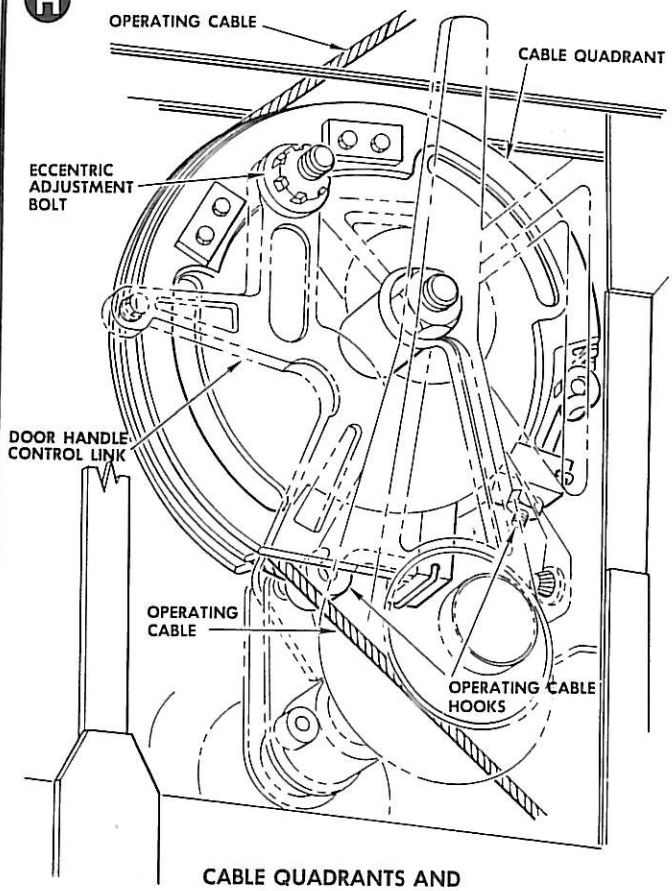
22.02.52.045-2 B

G

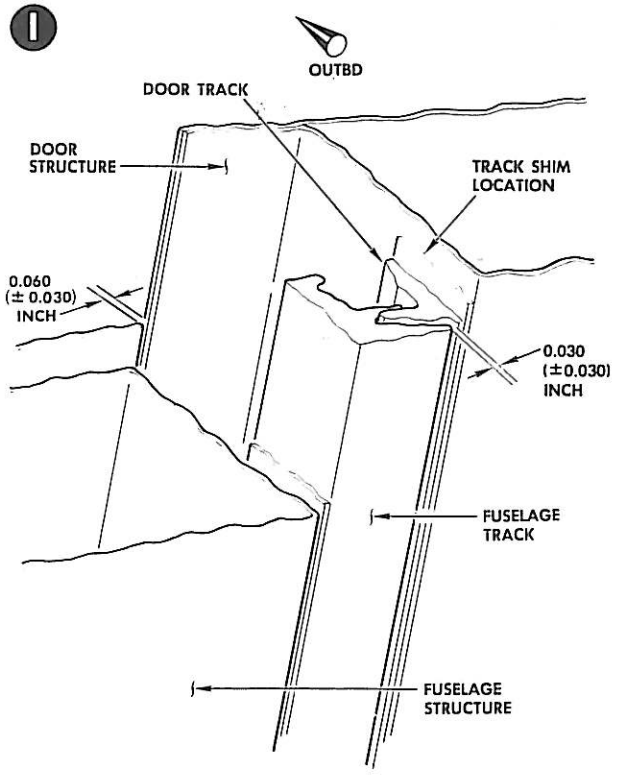


LOWER DOOR PIN AND RECEPTACLE

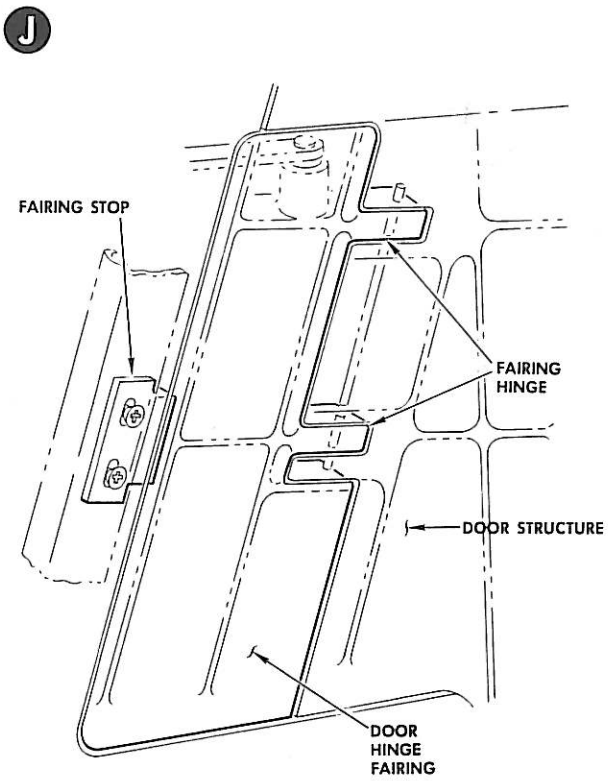
H



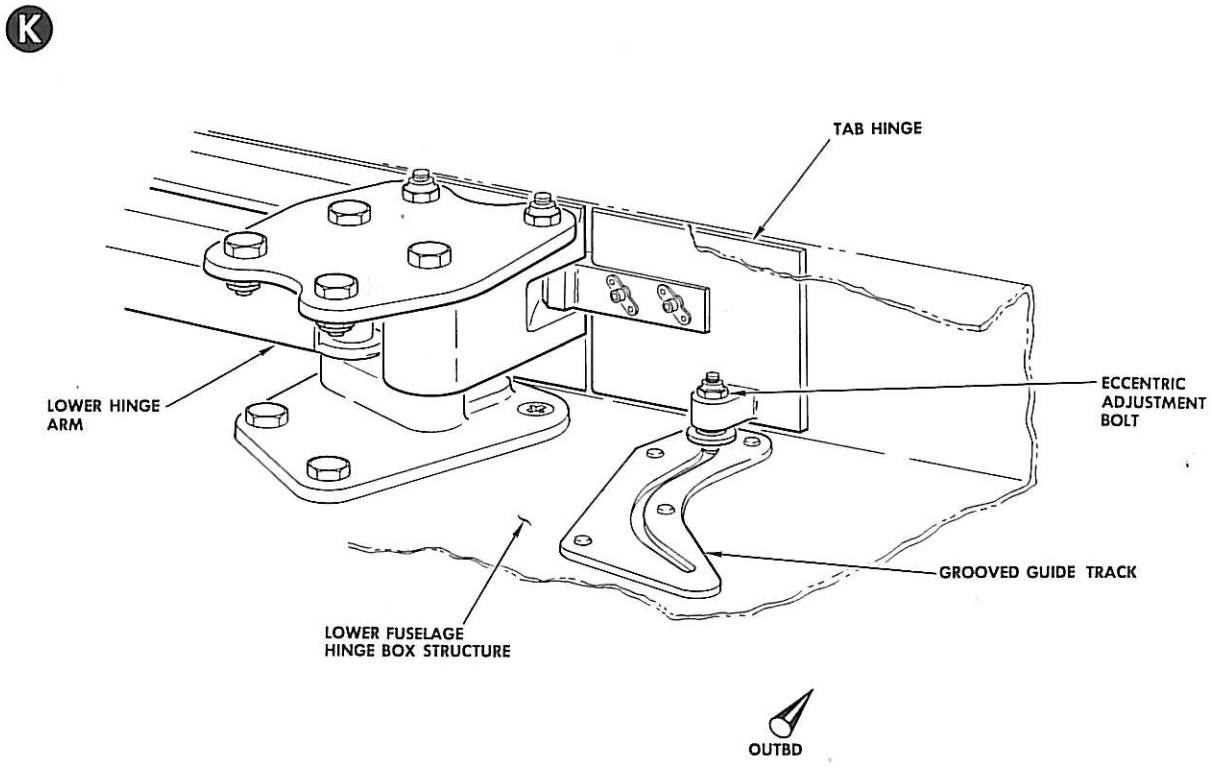
CABLE QUADRANTS AND ATTACHMENTS



DOOR TRACK CLEARANCE



DOOR HINGE FAIRING AND STOP



LOWER HINGE ARM TAB FAIRING

22.02.52.045-3B

Figure Detail

(6) With door closed, place inside handle in the full overcenter and locked position. Check tension load of upper portion of operating cable. If tension load is not within the range of 700 (±70) pounds, raise door four to six inches and adjust nut on cable hook for upper cable section. Close and lock door for tension load recheck.

(7) With door closed, and inner handle in full overcenter and locked position, check tension load of power portion of operating cable. If tension load is not within the range of 300 (±30) pounds, raise door four to six inches and adjust nut on cable hook for lower cable section. Close and lock door for tension load recheck.

NOTE: Adjustment of each section of cable will require re-adjustment of the opposite section until both are within tolerance.

(8) Raise and rotate door outward to full open position, depress interlock mechanism actuating pin on forward edge of door and secure so that handle interlock pin is withdrawn from the door handle shaft. — B

(9) Disconnect the interlock mechanism push-pull rod from the interlock actuating lever at lower end of door handle control link. — B

CAUTION: DO NOT ROTATE DOOR HANDLE TO "CLOSED" POSITION WITH DOOR OPEN AND INTERLOCK MECHANISM DISCONNECTED; DAMAGE TO DOOR HINGE FAIRING WILL RESULT.

*(10) To accomplish this step, gain access to slide tube and pulley brackets by removing the two small access plates on the forward inner surface of door. Remove nuts, washers, and bolts attaching vertical leg of each slide tube and pulley bracket to door structure and remove laminated shims. Loosen remaining slide tube and pulley bracket attach bolts. — C & D

NOTE: The slide tube and pulley brackets are loosened to permit shifting of the slide tube assembly in a fore or aft direction to align door and prevent cocking as door lowers.

(11) Rotate door 30 degrees to open position (approximately) and check hinge clearances.

(a) Remove or add washers under heads of hinge guide bolts to obtain 0.005 to 0.020-inch clearance between bolt head and the fuselage hinge box guides. — E

(b) If necessary, trim the fuselage hinge box guides to obtain correct clearance.

*Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.

(c) Remove or add hinge bumper shims as required to make hinge fair in with fuselage in a door closed position. — Figure Detail

NOTE: There shall be a minimum of one shim installed at each bumper location.

(12) Slowly lower door into the fuselage opening.

(a) Check door-to-fuselage skin clearances. For new doors, trim as necessary. Avoid excessive trim as final trim cannot be accomplished until after completion of slide tube adjustment.

(b) From inside the airplane, check alignment of the lower door pins and the upper "T" hooks with their respective receptacles as they begin to mesh.

CAUTION: DO NOT FORCE DOOR.

*(c) Shift slide tube and pulley brackets accordingly to accomplish door fore-and-aft alignment. — C & D

*(d) Measure inboard and outboard door hook and receptacle alignment at top of door. If misalignment exceeds 0.015 inch, open door and adjust the fuselage mounted "T" hook receptacles in an inboard or outboard direction. The receptacles are serrated to allow adjustment in increments of 0.032 inch.

NOTE: Shifting of the hook receptacles must be accompanied by varying the thickness of laminated shims at both attaching legs of the "T" hook receptacles. Do not bend attaching legs of hook receptacles when tightening bolts. Shims are adjustable within 0.003 inch which is maximum gap permissible before tightening bolts.

*(13) Repeat steps (12) (a) through (12) (d) until the lower pins and the upper "T" hooks align with their receptacles within 0.015 inch in all directions. The 0.015 inch dimension is taken at full width section of the hooks and pins. — F & G

* Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.

Figure Detail

NOTE: A maximum of one tapered shim tapered 0.030 to 0.060 inch in a forward or aft direction, or tapered in an inboard or outboard direction may be installed between each lower door pin and the door structure to assist alignment. Use shims only if necessary to align door pins with their receptacles.

(14) Lower door until the threshold stops on the lower door pins contact the pin receptacles. If gap between receptacle and threshold stop is greater than 0.030 inches, adjust nuts on the operating cable hooks to allow door to bottom fully on the threshold stops. Recheck cable tension as directed in steps (6) and (7). — G & H

NOTE: Door shall contact both stops at the same time.

*(15) Continue motion of the door handle until it overcenters.

(a) Check that full width section of the upper door "T" hooks extend through their receptacles a minimum of 0.030 inch. Add or remove shims behind the threshold stops on the lower door pins as required. — F & G

*(b) Check gaps at main tracks and stub tracks on forward and aft edges of door. Gap at main track shall be 0.030 (±0.030) inch at any portion of track, both sides of door. — I

NOTE: It may be necessary during initial check of the main track clearance to remove stub track shims to allow full motion of the main tracks within their tolerances. These shims are fuselage mounted. The main door tracks also may be shimmed up to 0.060 inch maximum to obtain correct clearance.

WARNING: DO NOT FILE TRACKS.

*Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.

	Figure Detail
*(c) After main track gap has been established, add or remove shims at the stub tracks each side of the door to maintain 0.000 to 0.030 inch gap. Stub track adjustment shall insure that sum of main track gap on either side of the door and the gap at the stub track on opposite side of door does not exceed 0.060 inch.	
*(16) With door fully closed make final adjustment to slide tube and pulley brackets at each end of the slide tube. Brackets are serrated for adjustment in increments of 0.032 inch.	C & D
(a) Add correct amount of shims behind vertical leg of each slide tube and pulley bracket and secure.	
(b) Door shall clear fuselage skin 0.060 (±0.030) inch; trim as necessary.	I
NOTE: Fuselage skin clearance must exceed track gap.	
(c) For allowable mismatch between door and fuselage skin; refer to Figure 502.	
NOTE: A maximum of one tapered shim, tapered 0.030 to 0.060 inch in a forward or aft direction, or tapered in an inboard or outboard direction may be installed between each lower door pin and the door structure to assist alignment. Use shims only if necessary to align door pins with their receptacles.	
(17) Rotate door handle toward the OPEN position.	
(a) Door shall begin to lift at approximately 8.5 degrees minimum handle rotation.	
(b) With door fully raised and open, check for clearance between lower surface of door control plate and top of bolt retainers in bottom of slide tube well.	H
(18) Adjust nylon hinge fairing stop on the forward inner surface of the door to hold the hinge fairing in contour when door is in the fully closed position.	J
NOTE: The hinge fairing stop is slotted to permit adjustment.	

*Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.

Figure Detail

(19) Adjust the lower hinge arm tab fairing. — K

(a) Remove two screws securing the hinge arm tab fairing (if installed) and remove tab fairing to gain access to eccentric adjustment bolt.

(b) Position adjustment bolt (if removed) so that eccentric head of bolt will engage grooved track in the lower fuselage hinge box guide, with threaded end of bolt through attach fitting of hinge arm tab.

(c) Add or remove washers between head of adjustment bolt and hinge tab fitting to adjust eccentric bolt engagement with grooved track.

(d) Rotate the eccentric adjustment bolt until the hinge arm tab fairs in with the fuselage contour; tighten nut securing the adjustment bolt.

(e) Reinstall screws securing the hinge arm tab fairing to the tab hinge.

(20) Free the interlock mechanism and reconnect the aft push-pull rod of the interlock mechanism to the interlock actuating lever at the lower end of the door handle control link. — B

(21) With door fully raised and open, adjust the interlock mechanism to meet the following conditions:

(a) Handle interlock pin is fully inserted into handle shaft.

(b) Interlock actuating pin on forward edge of door is fully extended. Switch pin on fuselage door frame should be extended 0.2 inch.

(c) With door closed and inner handle overcenter and bottomed out, upper roller on the interlock mechanism actuating lever should contact door handle control link. If link does not contact roller, lengthen handle latch push-pull rod and, to compensate, shorten interlock pin push-pull rod.

(22) Raise door carefully and swing out of opening. Check that door handle is locked to prevent lowering of door when door is approximately 20 degrees out of opening.

CAUTION: IN THE EVENT THE INTERLOCK MECHANISM IS NOT ENGAGED IN DOOR HANDLE SHAFT, DO NOT LOWER DOOR; DAMAGE TO HINGE FAIRING WILL RESULT.

(23) Swing door closed and lower carefully. Check that the interlock actuating pin on forward edge of door extends below interlock hook on door jamb.

(24) Using a spring scale, or torque wrench with special adapter made to fit inner handle hub, check door handle operating loads. Using a spring scale, handle loads shall not exceed 50 pounds through full range of travel with trim panel removed or 70 pounds with trim panel installed. Using a torque wrench with special adapter, handle loads are measured in foot-pounds; 50 foot-pounds through full range of travel with trim panel removed or 70 foot-pounds with trim panel installed.

NOTE: If spring scale is used, handle loads are measured perpendicular to a point 10 inches from center of handle shaft, in direction of rotation.

*(25) When hinge assembly or door assembly has been replaced, reinstall the slide tube and pulley bracket access doors on the interior surface of the door.

(26) Remove the interior door handle and reinstall the soundproofing and door interior trim; Refer to Chapter 25, EQUIPMENT/ FURNISHINGS.

(27) Reinstall the interior door control handle; Refer to 52-1-0.

(28) Adjust door microswitch; Refer to 52-6-0.

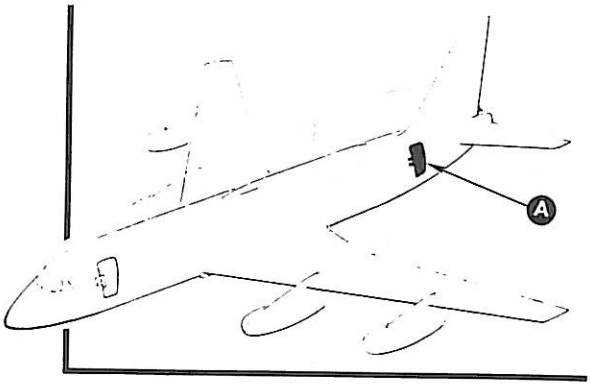
(29) Accomplish door inspection/check.

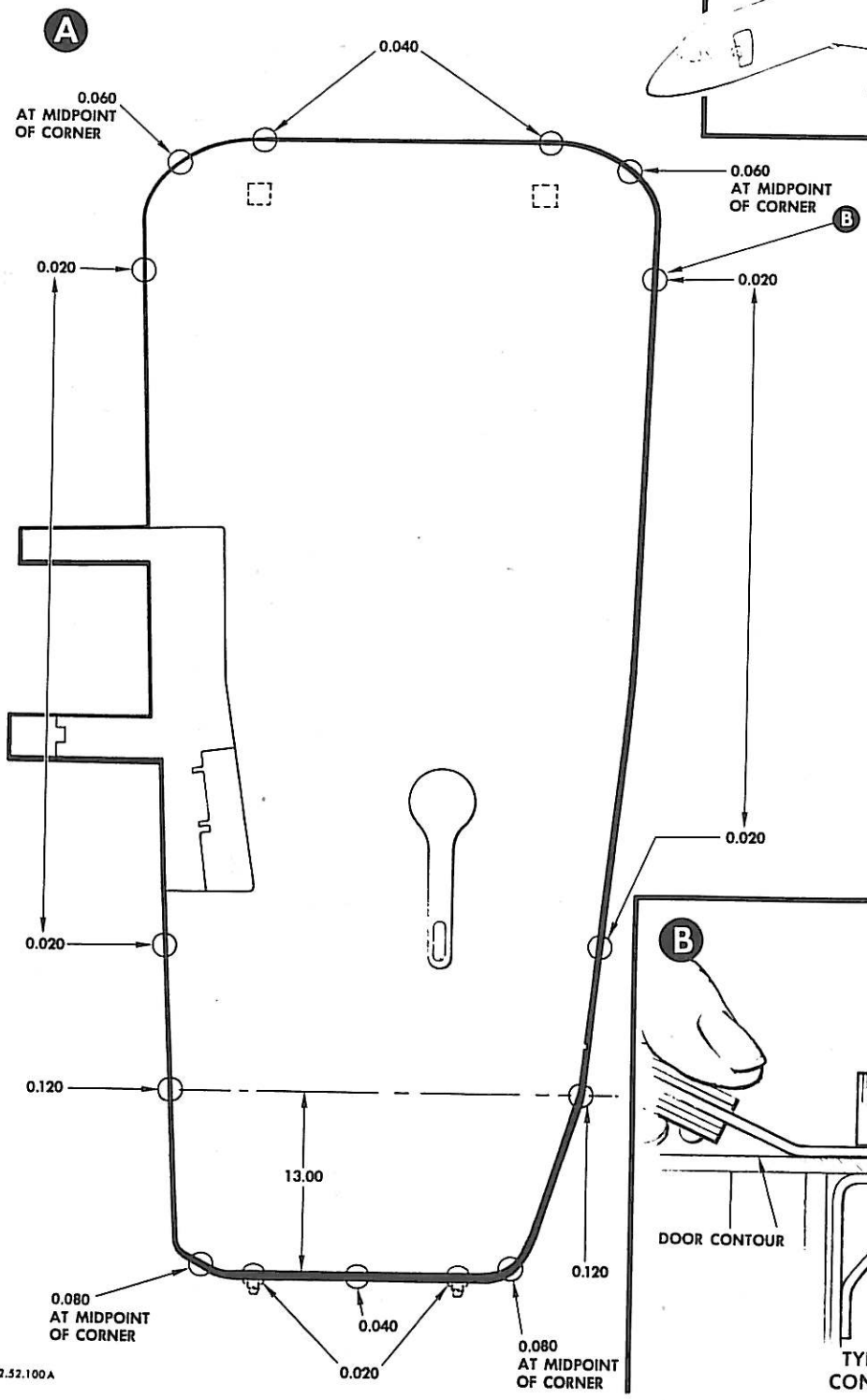
*(30) When door assembly has been replaced with a new door, pressurize fuselage cabin to normal operating pressure as directed in Chapter 21, AIR CONDITIONING. Recheck mismatch between door and fuselage skin; refer to Figure 502.

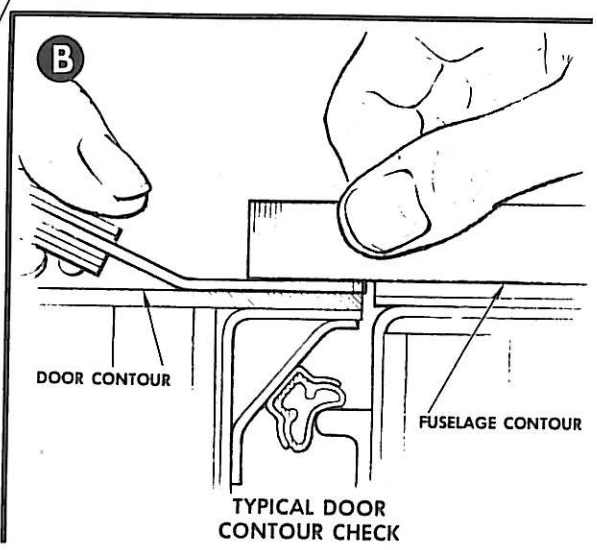
*Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.

NOTE:

1. ALL DIMENSIONS SHOWN ARE BELOW CONTOUR, ±0.030 INCH TOLERANCE.
2. AFTER PRESSURIZATION OF CABIN AS DIRECTED IN CHAPTER 21, AIR CONDITIONING, DOOR CONTOUR MUST MATCH FUSELAGE CONTOUR.







TYPICAL DOOR CONTOUR CHECK

REAR MAIN ENTRANCE DOOR - INSPECTION/CHECK

1. Inspection/Check Rear Main Entrance Door Assembly

A. Equipment Required - Spring scale or torque wrench with special adapter (Convair TSTO 22-57156) which fits inner handle hub to measure interior door handle operating loads. Spring scale also needed to check door snubber.

B. Procedure.

(1) With door closed, rotate the interior door handle approximately 180 degrees to the OPEN position.

(a) Door shall raise and control handle shall bottom out in the overcenter position.

(b) Door shall remain raised without applying external force.

(2) Rotate door to full open position.

(a) Door shall swing out until hinge stop linkage is fully extended and bottomed. Slowly rotate door to fully open and fully closed positions to determine that door snubber piston is not bottoming at extremes of travel. If proper snubber operation is questionable, check snubber as follows:

Disconnect snubber piston rod end from door hinge.

With snubber piston retracted, apply a constant 51 pound pull to piston rod end with spring scale and record time for piston to travel from fully retracted to fully extended position. Piston travel time should be a minimum of 12 seconds and a maximum of 50 seconds.

(b) Rotate interior door handle toward the closed position. The door interlock mechanism shall prevent handle movement.

CAUTION: IN THE EVENT THE INTERLOCK MECHANISM IS NOT ENGAGED IN THE DOOR HANDLE SHAFT, DO NOT ALLOW DOOR TO LOWER; DAMAGE TO HINGE FAIRING WILL RESULT. REFER TO DOOR ADJUSTMENT/TEST PROCEDURE.

(c) Hold-open hook shall engage in the hinge stop linkage.

(d) Pull edge of door toward the closed position. Hold-open hook shall prevent door closing.

(e) Actuate hold-open hook toward door opening. Hook shall toggle into position freeing the hinge stop linkage for movement.

(3) Rotate door into fuselage opening and slowly rotate the interior door handle to CLOSED position.

CAUTION: WHEN CLOSING DOOR NEVER ALLOW DOOR TO FREE FALL INTO DOOR OPENING; DAMAGE TO DOOR HINGE MECHANISM MAY OCCUR. MANUALLY ASSIST DOOR INTO CLOSED POSITION. DO NOT RESTRAIN DOOR AT INNER HANDLE, BUT ON AFT SIDE OF DOOR INNER SURFACE.

(a) As door lowers, check alignment of the lower door pins and the upper "T" hooks with their respective receptacles as they begin to mesh.

(b) As door reaches the fully closed position, it should bottom on the threshold stops (maximum allowable gap 0.030 inch) and the door handle shall rotate overcenter.

(c) The interlock actuating pin on forward edge of door shall extend below hook on door jamb sufficiently to actuate door-open warning microswitch.

(d) The door-open warning microswitch plunger shall be depressed 0.210 inch maximum when the interlock mechanism actuating pin reaches its fully extended position.

(e) Door seal shall contact striker around entire periphery of door.

(f) For allowable mismatch between door and fuselage skin; refer to Adjustment/Test. Door shall clear fuselage skin 0.060 (±0.030) inch.

(g) The exterior door handle shall be flush with the exterior skin of door.

(4) Check interior door handle loads with spring scale or torque wrench. Handle load shall not exceed 50 pounds through full range of travel with trim panel removed (70 pounds with trim panel installed).

NOTE: If spring scale is used load on handle is measured perpendicular to a point on handle centerline 10 inches from center of handle hub, in direction of handle rotation.

(5) Check upper operating cable tension; refer to Adjustment/Test for procedure.

(6) Check lower operating cable tension; refer to Adjustment/Test for procedure.

(7) Repeat steps (1) through (3) (g) except use the exterior door handle.

(8) Rotate the interior door handle to the OPEN position, then rotate the exterior door handle to OPEN position.

(a) At OPEN position the exterior door handle shall engage the interior door handle.

(9) Close door using the exterior door handle.

CAUTION: WHEN CLOSING DOOR NEVER ALLOW DOOR TO FREE FALL INTO DOOR OPENING; DAMAGE TO HINGE MECHANISM MAY OCCUR. MANUALLY ASSIST DOOR INTO CLOSED POSITION. DO NOT RESTRAIN DOOR AT INNER HANDLE, BUT ON AFT SIDE OF DOOR INNER SURFACE.

FORWARD SERVICE DOOR - DESCRIPTION AND OPERATION

1. General

The forward service door (see Figure 1) is approximately 24 x 48 inches in size and is located on the forward right side of the passenger compartment between fuselage stations 413 and 440 and may be opened from either inside or outside the cabin. Sealing around the door is provided by molded bulb type wire-reinforced pressure seal that is energized by cabin pressure.

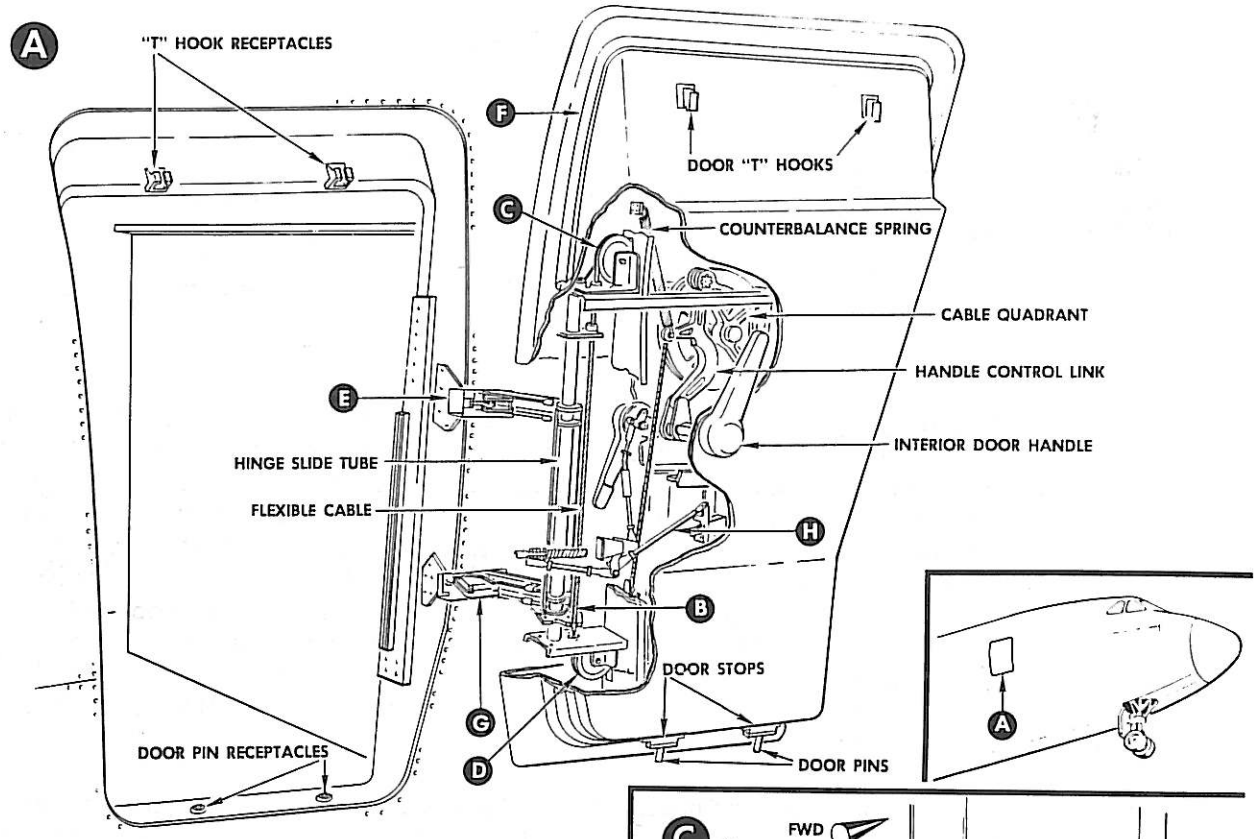
2. Structure

The forward service door structure is similar to that in the main entrance doors, utilizing conventional rib and skin construction and 2024 and 7075 aluminum alloy throughout. Construction consists of an outside frame with interconnecting horizontal and vertical ribs. The outer skin is riveted to and forms an integral part of the door frame and rib structure. Partial inner skins enclose part of the rib structure and form a vertical torque box along the forward and aft portion of the door and at the top and bottom. The door handles are cast magnesium and the door operating mechanism supports are aluminum castings. The interior surface of the door is covered with an acoustical material, and is trimmed compatible with the decor of the airplane interior.

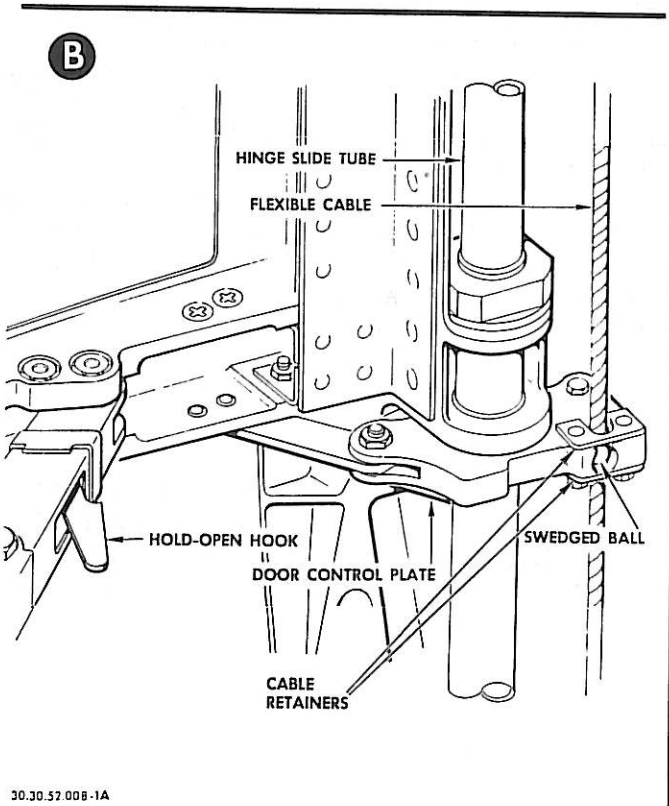
Forward service door restrainment is similar to the main entrance doors except that stub tracks are not used. Continuous vertical tracks approximately 27 inches long are bolted to the forward and aft edges of the door. Moly black epoxy top coating has been added to the door tracks for chafe prevention. Refer to Chapter 51, STRUCTURES - GENERAL, for application procedure. Two round door pins are located in the bottom edge of the door, and two "T" hooks are located along the upper edge. An adjustable door stop, positioned by laminated shims, is provided on each of the bottom edge door pins. These stops contact the fuselage threshold and limit vertical travel of the door into the tapered fuselage opening. The "T" hooks on the upper edge of the door mate with receptacles in the fuselage. These receptacles are adjustable inboard and outboard through a serrated horizontal plate. Laminated shims are installed behind the vertical attach leg of these receptacles to compensate for inboard and outboard adjustment.

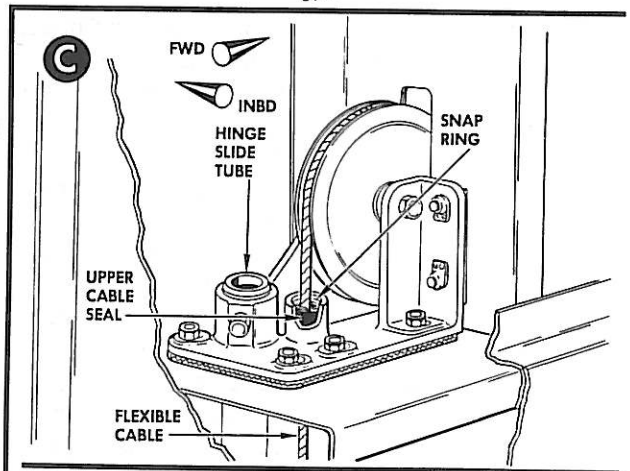
3. Door Operating Mechanism

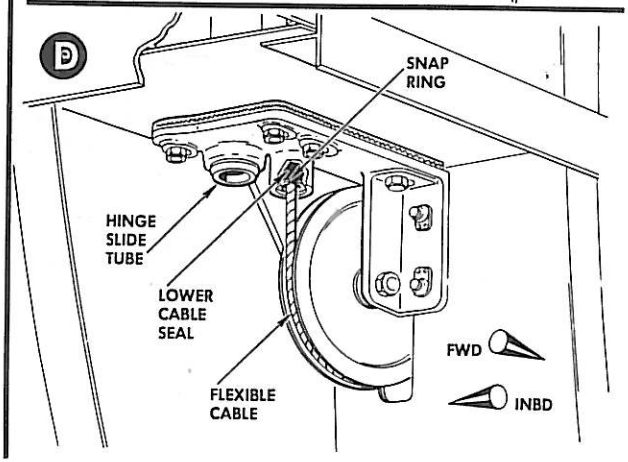
The door operating mechanism on the forward service door consists of an exterior and interior door control handle, door handle control link, cable quadrant, door control plate, a counterbalance spring, a flexible operating cable, a hinge slide tube, and articulating hinge linkages. Also included is a door interlock mechanism, a spring-loaded door hold-open hook, a door snubber, and an upper and lower cable seal.



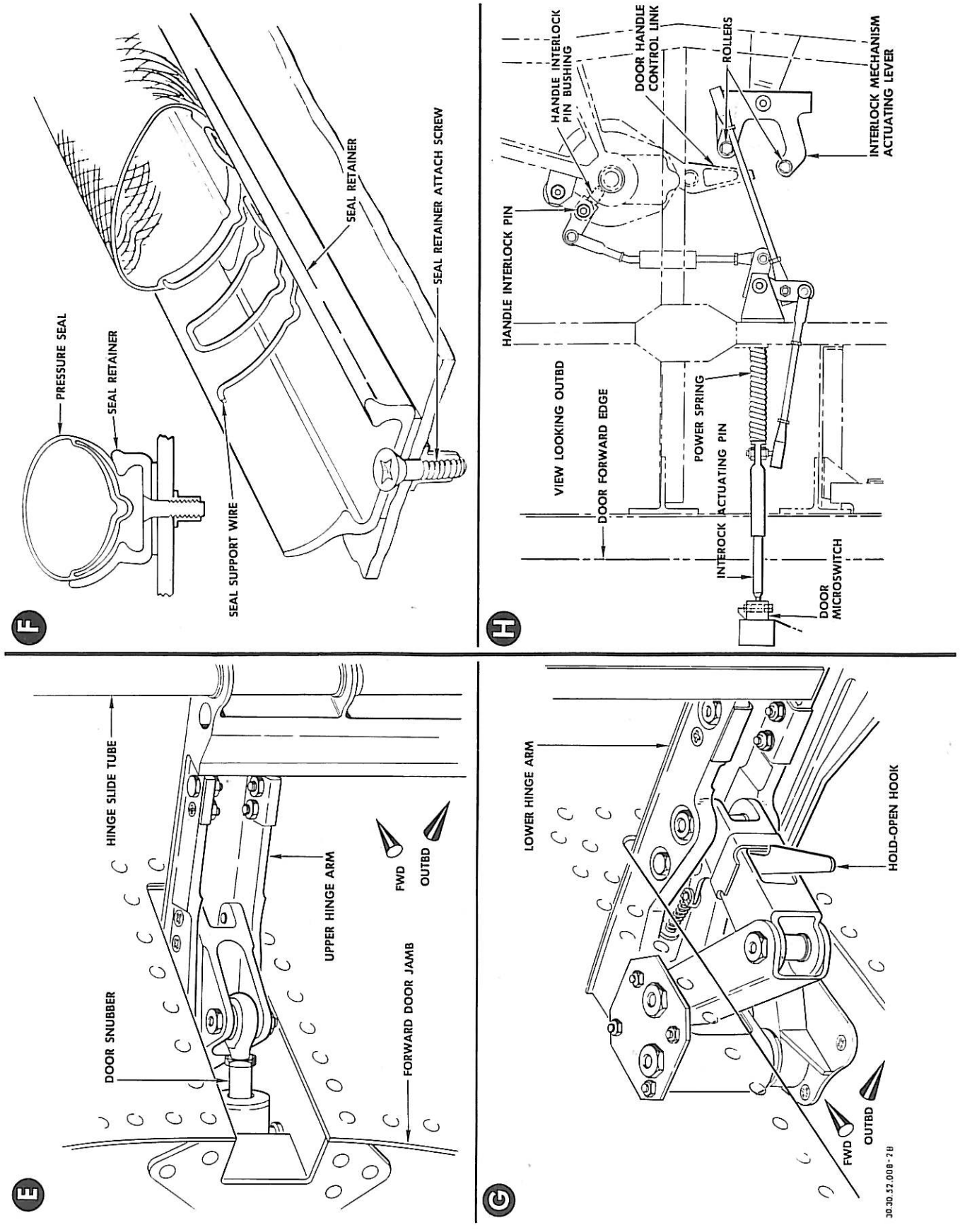
FORWARD SERVICE DOOR







30.30.52.008-1A


F
PRESSURE SEAL
SEAL RETAINER
SEAL SUPPORT WIRE
SEAL RETAINER
SEAL RETAINER ATTACH SCREW
H
HANDLE INTERLOCK PIN BUSHING
DOOR HANDLE CONTROL LINK
ROLLERS
INTERLOCK MECHANISM ACTUATING LEVER
HANDLE INTERLOCK PIN
VIEW LOOKING OUTBD
DOOR FORWARD EDGE
POWER SPRING
INTEROCK ACTUATING PIN
DOOR MICROSWITCH
E
HINGE SLIDE TUBE
UPPER HINGE ARM
FWD
OUTBD
DOOR SNUBBER
FORWARD DOOR JAMB
G
LOWER HINGE ARM
HOLD-OPEN HOOK
FWD
OUTBD
30.30.52.008-2B

The exterior door handle on the forward service door is recessed into the door, flush with the exterior surface of the airplane, and is installed on a coaxial shaft with the interior door handle. The interior door handle operates independently of the exterior door handle; however, operation of the exterior handle results in movement of the interior handle. Door handle rotation is transmitted through the door handle control link to the cable quadrant. Each end of the flexible operating cable attaches to this cable quadrant. A swedged ball near the operating cable midpoint secures the cable in a recess in the door control plate at the door lower hinge arm attachment. This operating cable, being attached to the door control plate and the cable quadrant, provides the effecting means by which the door is raised, lowered, and locked into overcenter positions. The counterbalance spring aids in balancing the door weight as the door is raised, and provides a force for holding the mechanism overcenter in the fully open and closed positions.

The articulating hinge on the door will pivot so as to place the door forward of the door opening and parallel to the fuselage in the full open position. A snubber is mounted at the door upper hinge box and attaches to the door upper hinge arm to dampen the inertia forces of the door opening and closing. The hold-open hook and hinge-stop linkage are located at the door lower hinge arm and prevent the door from inadvertently closing or coming into contact with the fuselage when open.

The door operating mechanism is augmented by an interlock mechanism consisting of an interlock actuating pin on the forward edge of the door, a door handle interlock pin, interlock mechanism actuating lever, power spring, and connecting push-pull rods and bell cranks. When the door is closed and locked, the interlock actuating pin on the forward edge of the door extends below a hook retainer on the forward door frame. This pin serves as a fail-safe pin which will engage the hook retainer in the event the cinch-down mechanism malfunctions. The interlock actuating pin prevents the door from inadvertently opening. It also actuates the door microswitch to control the associated door-open warning light (refer to 52-6-0). The door handle interlock pin latches the handle up when the door is swung out of the opening; it prevents lowering of the door with door in the open position. The door handle control link of the door operating mechanism operates the interlock mechanism actuating lever and in turn sequences operation of the interlock actuating pin on the forward edge of the door. The power spring provides an actuating force to operate the interlock actuating pin.

A. Door Mechanism Operation.

A single 180 degree rotation of the exterior or interior door control handle raises the door approximately nine inches to allow the door to be swung open. When opening the door from the outside, the exterior handle must be levered out of its recess before rotation can be initiated. Door handle extraction is accomplished by first depressing one end of a small lever in the handle. This action provides a projecting

lever which may be gripped with the fingers. The door handle may then be pulled sufficiently from its recess to permit grasping the door handle with the other hand. Pulling the exterior handle outboard engages a driving dog on the exterior door handle shaft with the interior door handle shaft and after initial rotation of the door handle, an outboard pull is no longer necessary. The first 10 degrees of handle motion takes the door operating mechanism out of the overcenter configuration and retracts the interlock mechanism actuating pin on forward edge of door. The door microswitch located forward of the door opening in the fuselage structure deactuates and illuminates a warning light. Further rotation of the door control handle causes the door to rise, disengaging the upper door "T" hooks and the lower shear pins that secure the door in the closed position.

At the completion of the nine-inch vertical travel (180 degrees of control handle rotation), the door tracks will clear the fuselage tracks, thus permitting the door to be pivoted outboard around the articulating hinge on the forward edge of the door. The overcenter action of the door operating mechanism will hold the door in the raised position. As the door is opened outward the interlock mechanism locks the door control handle shaft to prevent lowering of the door. The articulating hinge changes the pivot points of the door as it rotates to the full open position thus placing the door forward of the opening and parallel to the fuselage. Guidance of the door is not required as this is accomplished by the hinge mechanism.

A snubber at the door upper hinge arm dampens the inertia forces of the door when opening and closing. This snubber operates only during motion of the hinge and becomes increasingly more effective as the hinge approaches the fully open or fully closed position. The door is restrained in the full open position by the hinge-stop linkage on the door lower hinge arm which is locked with the hold-open hook. This hold-open hook need not be held for position as it is spring-loaded and has a snap action.

Closing the door is accomplished by reversing the door opening procedure; however, the hold-open hook must be manually released when closing the door. It is finger operated in a direction toward the fuselage. In the event the door handles are not engaged with each other when accomplishing the door closing cycle (when operating from the outside), the exterior handle can be rotated 360 degrees until the driving dog reengages the mating recess of the interior handle shaft. Engagement can only occur when the handles are in phase with each other due to the offset of the driver and mating recess from the door handle shaft centerline.

4. Seal

A bulb-type seal, (see Figure 1) energized by cabin pressure, is employed between the door and the door frame. Vent holes are provided in the inboard or pressure side of this seal. Cabin pressure passes through these holes and forces the crown of the seal against the seal striker around door opening.

The seal is constructed of tear-resistant silicone rubber, reinforced with Dacron fabric and contains an inner and outer pressure wall. Dual wall construction is a fail-safe feature to preclude loss of pressurization in the event of unforeseen damage to the outer pressure wall. The seal is also reinforced with a flexible spring steel wire, integrally molded within the seal, to eliminate the possibility of seal collapse. The integral spring wire supports the side walls of the seal against lateral pressure loads when pressurized, to assure positive alignment with the fuselage striker. The seal is vulcanized into a single one-piece unit to fit the extruded aluminum alloy seal retainer.

The seal retainer is screwfastened and riveted around the inside periphery of the door. The retainer consists of a formed section with two protruding lips along each side of its inner surface, near the base. These lips fit over the molded flanges along each side of the seal and restrain the seal in position.

5. Drainage Provisions

A. Hinge Structural Box Drain.

There are two nylon drain tubes installed to the upper and lower structural hinge boxes for moisture drainage. One drain tube is installed between the upper and lower hinge boxes to drain moisture from the upper hinge box into the lower hinge box. Another drain tube is installed to the bottom of the lower hinge box to a drain outlet in the fuselage skin.

B. Door Pin Receptacle Drain (Lower Shear Pins)

A drain adapter cup is installed on the underside of each door pin receptacle to collect liquids and debris that may pass through the door pin hole. Clamped to the bottom of the cup is a flexible low pressure hose which in turn clamps to a drain outlet in the fuselage skin.

FORWARD SERVICE DOOR - TROUBLE SHOOTING

POSSIBLE CAUSE	ISOLATION PROCEDURE AND CORRECTION
1. DOOR DOES NOT OPERATE WITH HANDLE MOTION	
A. Sheared pin at attachment of door handle control link to fork on door interior handle shaft.	Replace pin.
B. Broken door operating cable.	Replace cable.
C. Interlock pin bushing partially out of door handle housing hub.	Remove door interlock mechanism access hole cover from inside surface of door trim panel or remove entire trim panel. (Refer to Chapter 25, EQUIPMENT/FURNISHINGS). Push bushing into handle housing hub to free interlock mechanism. Incorporate bushing retainer clip on bushing at earliest opportunity. (See 52-1-0 CABIN EXTERIOR DOORS Approved Repairs.)
D. Cable midpoint ball out of slide tube control plate.	Replace cable midpoint ball in slide tube control plate, and safety wire.
2. DOOR HANDLE OPERATING LOADS EXCESSIVELY HIGH	
A. Operating cable tension too high.	Readjust cable tension; refer to door Adjustment/Test procedure.
B. Door binding in fuselage opening.	Accomplish door Adjustment/Test procedure.
C. Burrs on door tracks or daggers.	Remove burrs, refer to Structural Repair Manual for Door Track Allowable Damage Limits.
3. DOOR OPERATING MECHANISM WILL NOT LOCK OVERCENTER IN DOOR FULLY RAISED AND LOWERED POSITIONS	
A. Operating cable tension too low.	Readjust cable tension; refer to door Adjustment/Test procedure.
B. Broken counterbalance spring.	Replace counterbalance spring.

POSSIBLE CAUSE	ISOLATION PROCEDURE AND CORRECTION
4. HINGE FAIRING DOES NOT FAIR IN WITH FUSELAGE CONTOUR	
A. Nylon hinge fairing stop broken or out of adjustment.	Replace or adjust hinge stop; refer to door Adjustment/Test procedure.
B. Bent or broken hinge fairing link.	Replace hinge fairing link.
5. DOOR-OPEN WARNING LIGHT DOES NOT FUNCTION PROPERLY	
A. Circuit or light bulb malfunction.	Refer to DOOR-OPEN WARNING SYSTEM TROUBLE SHOOTING, Section 52-6-0.
6. INTERLOCK ACTUATING PIN, ON FORWARD EDGE OF DOOR IS NOT WITHDRAWING TO CLEAR HOOK RETAINER WHICH IS IMMEDIATELY ABOVE MICROSWITCH PLUNGER ON DOOR FORWARD JAMB. DOOR WILL EITHER STOP APPROXIMATELY TWO INCHES FROM CLOSING OR CAN NOT BE OPENED WITH HANDLE MOTION.	
A. Interlock actuating pin mechanism out of adjustment.	Adjust interlock actuating mechanism, (refer to Adjustment/Test).
7. DOOR EXCEEDINGLY HARD TO OPEN OR CLOSE, ESPECIALLY IN THE HALF-WAY OPEN OR HALF-WAY CLOSED POSITION	
A. Broken snubber-to-door attachment bolt.	Replace snubber-to-door attachment bolt.
B. Snubber out of adjustment.	Adjust snubber; refer to Adjustment/ Test procedure.
8. DOOR BINDS, CAUSING EXCESSIVE HANDLE LOAD; WILL NOT RAISE OR LOWER THE FULL AMOUNT OF TRAVEL	
A. Bent slide tube.	Replace slide tube.
9. FUSELAGE TRACKS AND DOOR TRACKS DO NOT PROPERLY MATE WHEN CLOSING DOOR	
A. Allowing door to free fall into closed position.	Manually assist door into closed position. Do not restrain door at inner handle, but on aft side of door inner surface.
10. DOOR JAMMED IN THE CLOSED POSITION	
A. Top edge of door skin damaged and caught on edge of fuselage skin.	Insert a thin piece of sheet metal, approximately two feet long, between door skin and fuselage skin. Sheet metal to act as a sliding surface which will prevent skin interference when door rises. Open door, reshape door skin and fuselage skin to proper contour.

POSSIBLE CAUSE	ISOLATION PROCEDURE AND CORRECTION
11. EXTERIOR DOOR HANDLE LOOSE	
A. Large coil spring broken inside interior door handle assembly.	Replace large coil spring.
12. EXTERIOR DOOR HANDLE ROTATES BUT WILL NOT ENGAGE TO RAISE DOOR	
A. Large coil spring broken inside interior door handle assembly.	Replace large coil spring.
13. DOOR LOOSE IN OPEN POSITION	
A. Due to continuous operation of door, dimension of 0.005 to 0.020-inch between the slide tube control plate and titanium rub strips has become excessive.	Add shims, as required, between the titanium rub strips and door structure to maintain the 0.005 to 0.020-inch dimension between the slide tube control plate and titanium rub strips.

FORWARD SERVICE DOOR - REMOVAL/INSTALLATION

1. Removal/Installation Forward Service Door (see Figure 401)

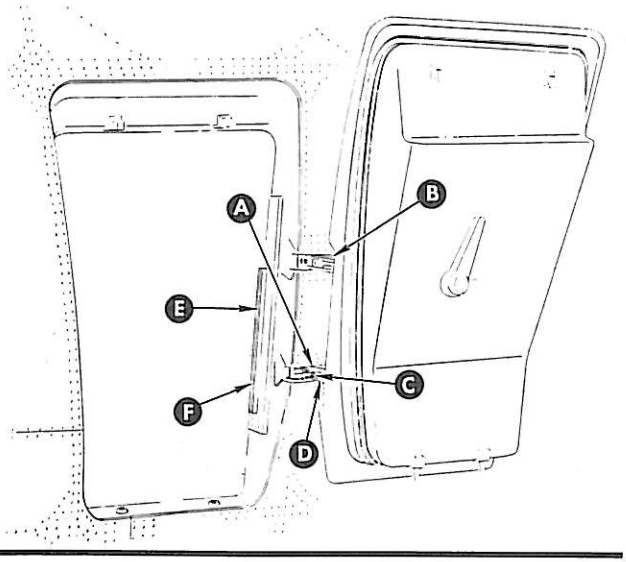
A. Equipment Required - None.

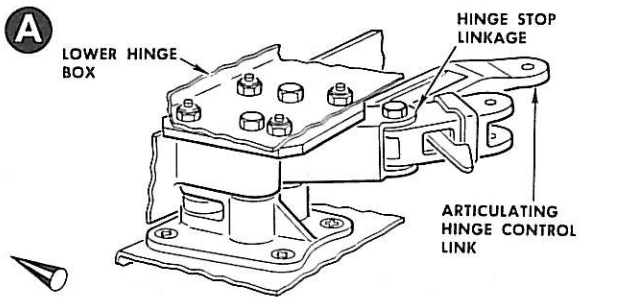
B. Remove Forward Service Door.

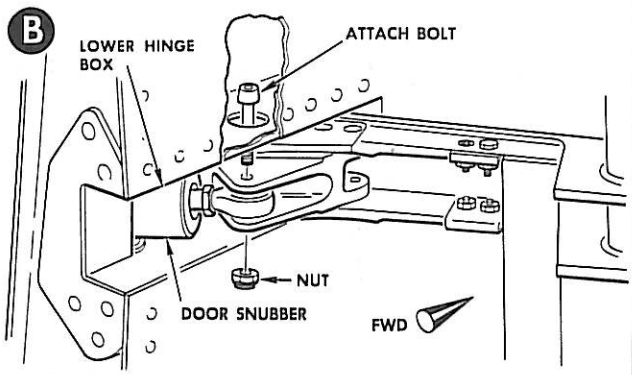
	Figure Detail
(1) Rotate door to open position.	
(2) Remove cotter pin, washer, and pin from link connecting the lower hinge arm to the adjustable plate on lower hinge arm stop linkage.	A
(3) Remove necessary trim and insulation to gain access to the hinge attach bolts. (Refer to Chapter 25, EQUIPMENT/ FURNISHINGS.)	
(4) Remove nut, bolt, and bushing connecting rod end of door snubber to the upper door hinge arm.	B
NOTE: Open service door about 45 degrees to remove bolt from connecting rod end of door snubber. Bolt head must align with hole in upper surface of hinge box for removal.	
(5) Remove nut, bolt, and bushing connecting hinge stop linkage to the lower hinge arm of door.	C
(6) Remove nut, bolt, and bushing connecting the articulating hinge control link to the door control plate.	D
(7) Provide adequate support for door.	
(8) Remove nut from upper and lower hinge arm attach bolts at the fuselage hinge boxes.	E & F
(9) Remove the lower hinge arm attach bolt.	E
(10) Remove the upper hinge arm attach bolt.	F
(11) Slide hinge arms out of the fuselage hinge boxes; retain washers and bushings used at hinge connection to the fuselage.	
(12) Remove door from fuselage.	
NOTE: Examine coating on door tracks. Repair (or replace) coating it it is worn sufficiently to expose bare metal. Refer to Chapter 51, STRUCTURES-GENERAL, for application procedure. By accomplishing this on door removal, time will be gained to allow coating to cure before reinstalling door.	

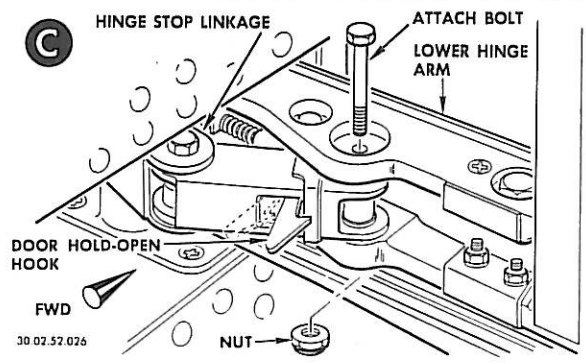
C. Install Forward Service Door.

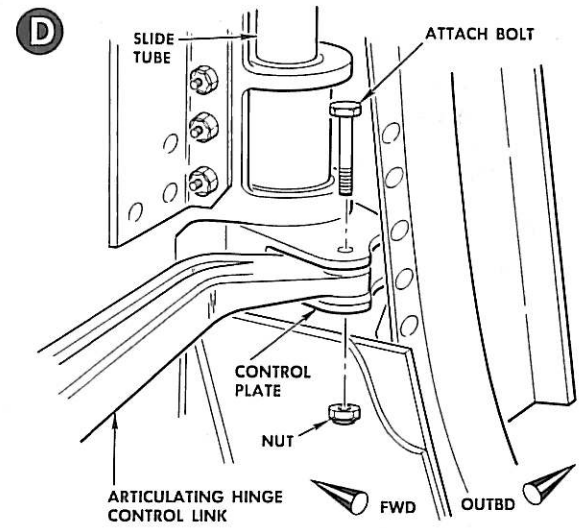
(1) Support forward service door so hinge arms align with fuselage hinge boxes.

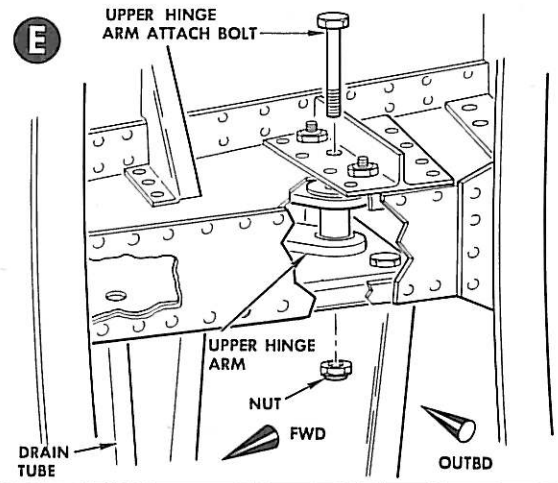

A
B
C
D
E
F


A
LOWER HINGE BOX
HINGE STOP LINKAGE
ARTICULATING HINGE CONTROL LINK


B
LOWER HINGE BOX
ATTACH BOLT
NUT
DOOR SNUBBER
FWD


C
HINGE STOP LINKAGE
ATTACH BOLT
LOWER HINGE ARM
DOOR HOLD-OPEN HOOK
FWD
NUT
30.02.52.026


D
SLIDE TUBE
ATTACH BOLT
CONTROL PLATE
NUT
ARTICULATING HINGE CONTROL LINK
FWD
OUTBD


E
UPPER HINGE ARM ATTACH BOLT
UPPER HINGE ARM
NUT
FWD
DRAIN TUBE
OUTBD

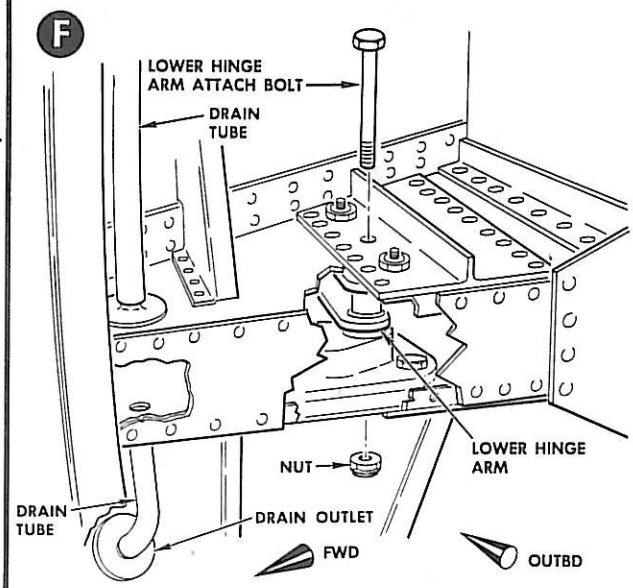

F
LOWER HINGE ARM ATTACH BOLT
DRAIN TUBE
NUT
LOWER HINGE ARM
DRAIN TUBE
DRAIN OUTLET
FWD
OUTBD

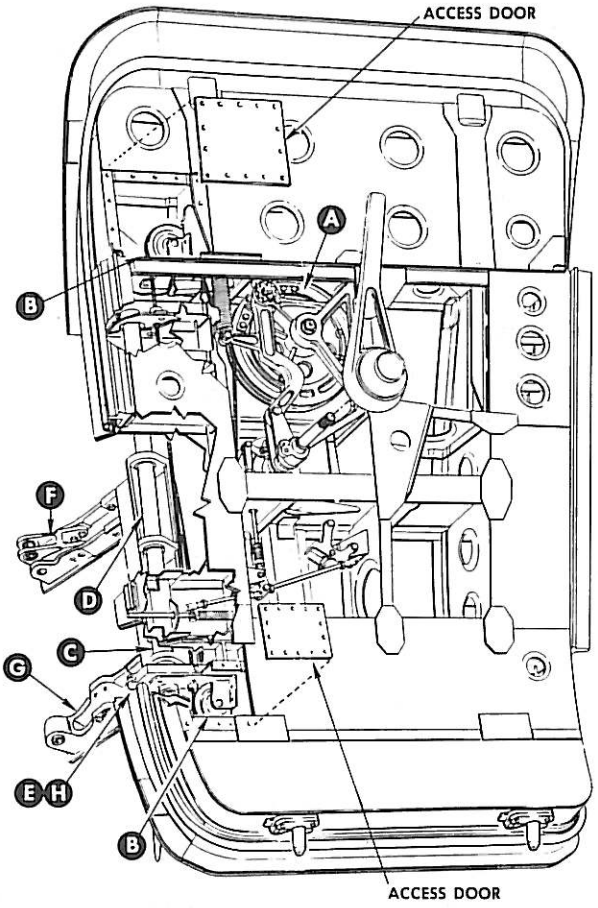
	Figure Detail
(2) Insert bushings in the door hinge pivot fittings of the upper and lower hinge arms.	E & F
(3) Align hinge with attach holes in the fuselage hinge boxes.	
(4) Install a washer between hinge bushings and the fuselage hinge box, above and below each door hinge arm.	
(5) Insert upper and lower hinge attach bolts through the fuselage hinge boxes, door hinge arms, bushings, and washers, install nuts.	
(6) Insert bushing in the articulating hinge control link and align bushing with attach hole in the door control plate.	D
(7) Install bolt and nut connecting the articulating hinge control link to the door control plate.	
(8) Insert bushing in door hinge-stop linkage and align with stop linkage attach hole in the lower door hinge arm.	C
(9) Install bolt and nut connecting stop linkage to the hinge arm.	
(10) Insert bushing in rod end of door snubber and align with snubber attach hole in the upper door hinge arm.	B
(11) Install bolt and nut connecting snubber to the upper hinge arm of door.	
NOTE: Open service door about 45 degrees to install bolt in connecting rod end of door snubber. Bolt head must align with hole in upper surface of hinge box for installation.	
(12) Install pin, washer, and cotter pin connecting link of lower hinge arm to the adjustable plate on the lower hinge arm stop linkage.	A
(13) Accomplish forward service door adjustment/test procedure.	

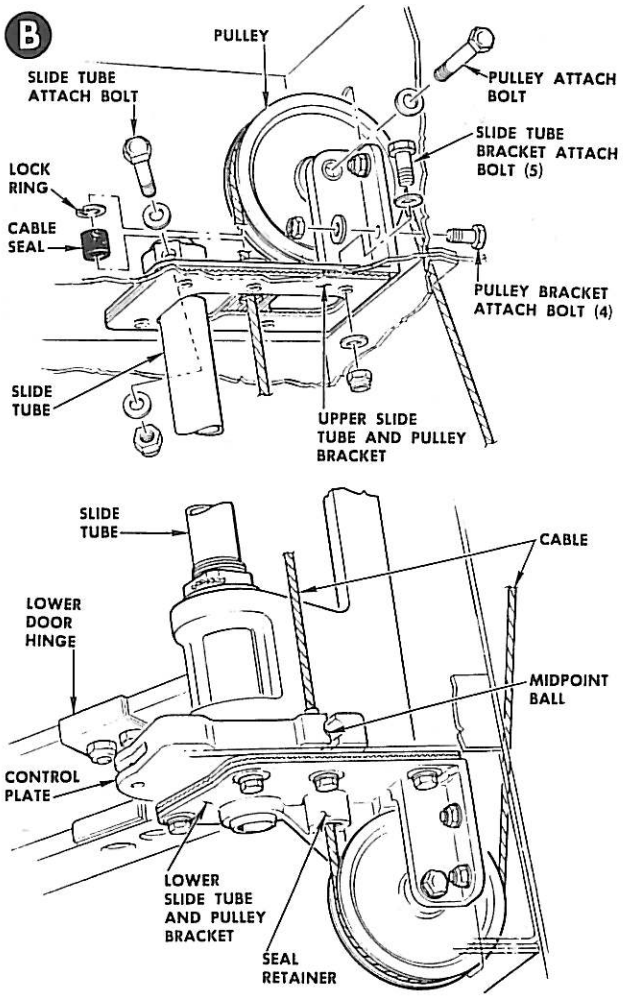
2. Removal/Installation Forward Service Door Hinge (see Figure 402)

A. Equipment Required.

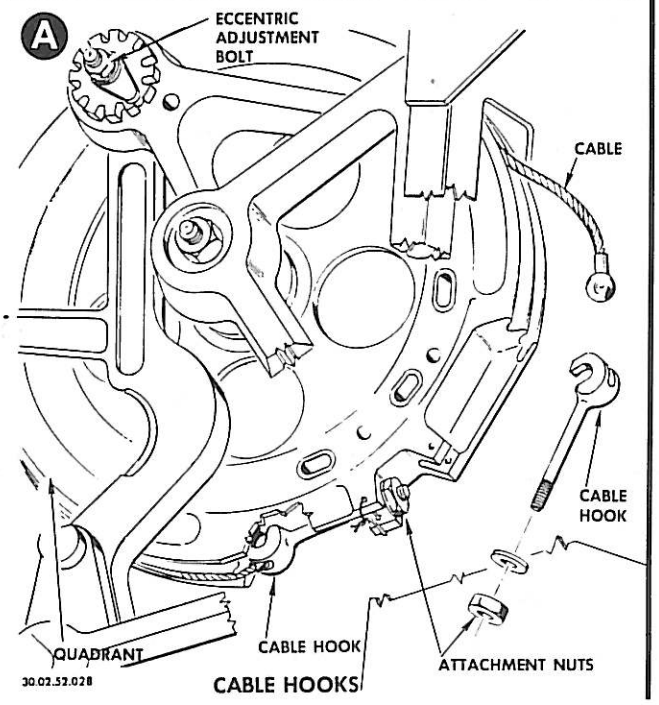
(1) Torque wrench calibrated in inch-pounds.

(2) Aliphatic naphtha, Federal Specification TT-N-95a.

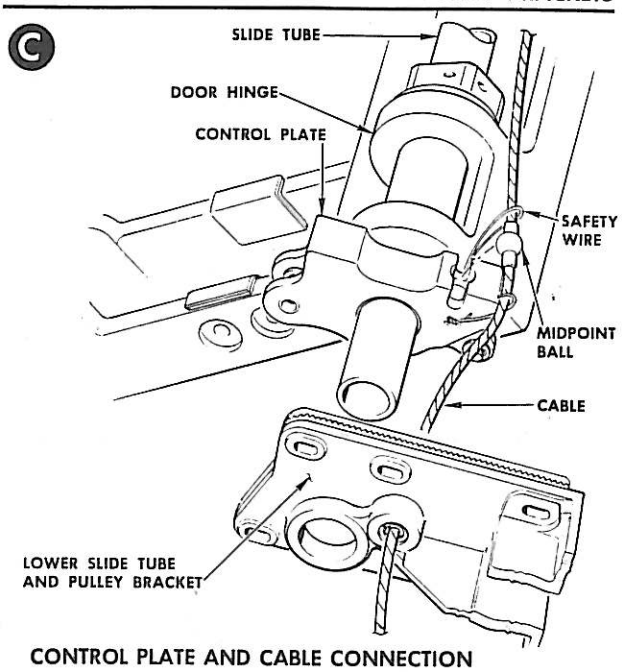




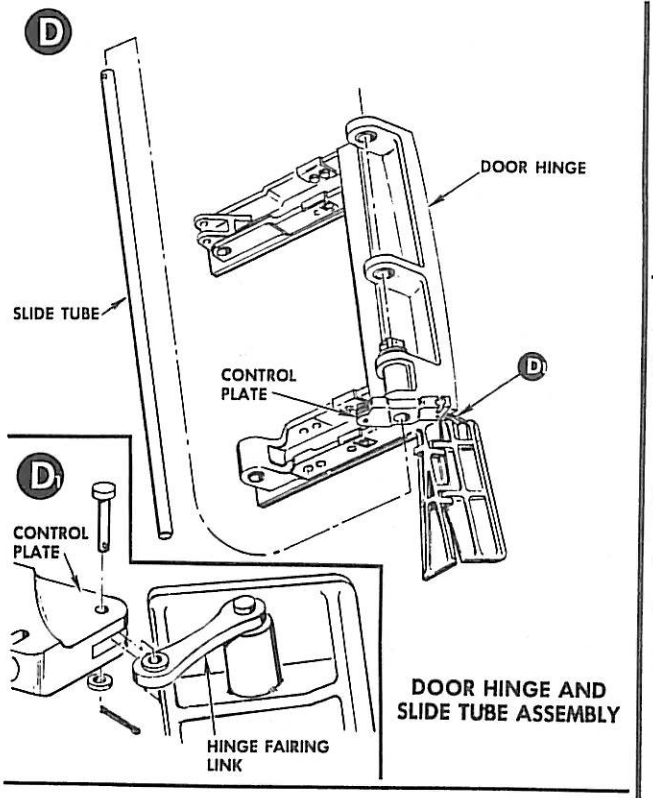
UPPER AND LOWER SLIDE TUBE AND PULLEY BRACKETS



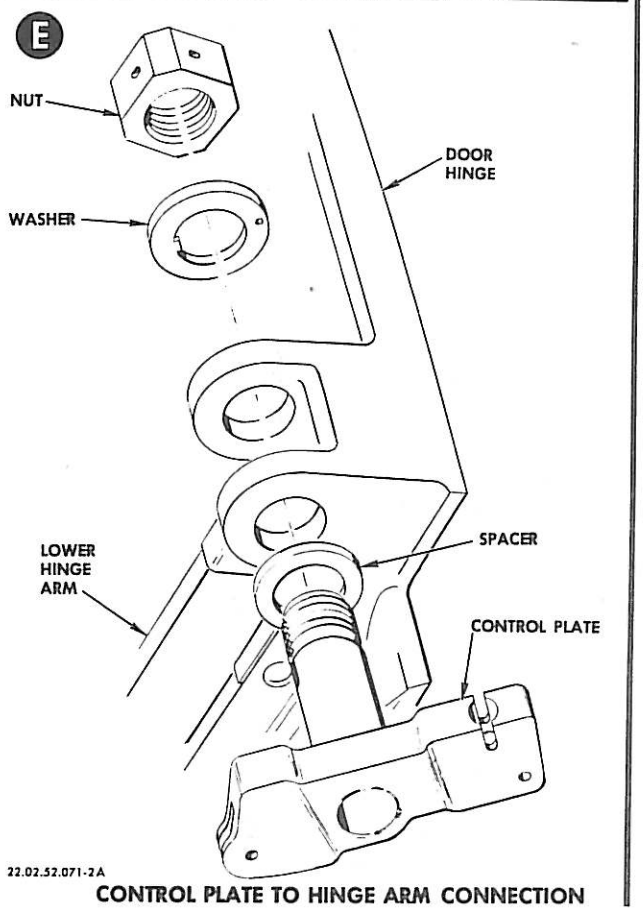
CABLE HOOKS



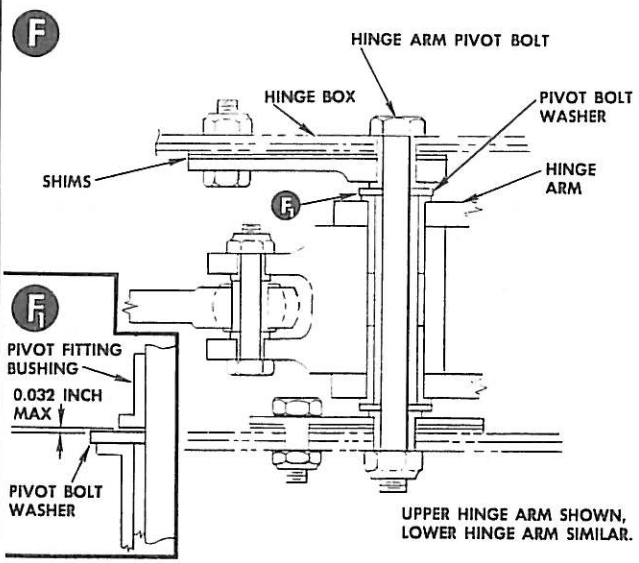
CONTROL PLATE AND CABLE CONNECTION



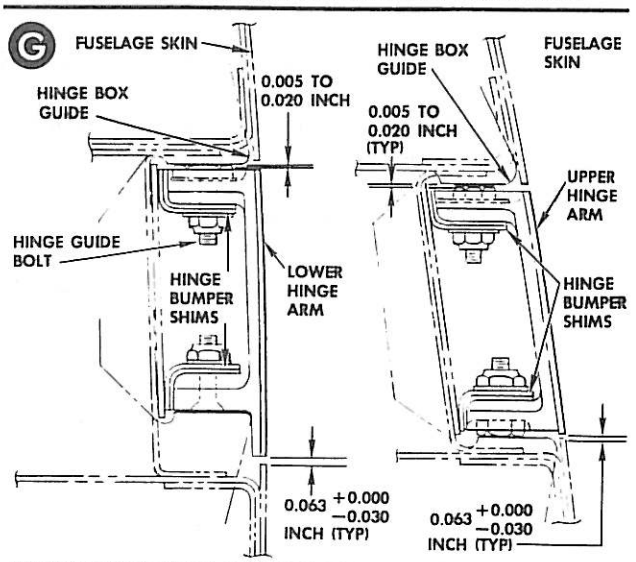
DOOR HINGE AND SLIDE TUBE ASSEMBLY



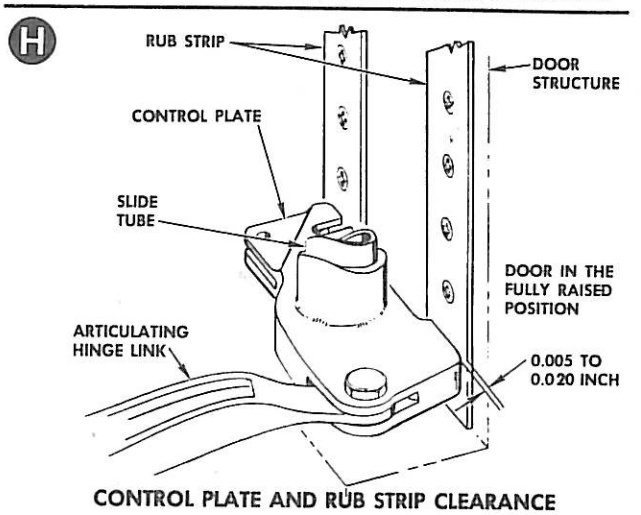
CONTROL PLATE TO HINGE ARM CONNECTION



TYPICAL HINGE ARM AND HINGE BOX CLEARANCE



HINGE GUIDE BOLT AND HINGE BOX GUIDE CLEARANCE



CONTROL PLATE AND RUB STRIP CLEARANCE

(3) EC1293 Sealer, 3M Co., St. Paul 6, Minn., or equivalent. Figure Detail

(4) Grease, Specification MIL-G-7421.

B. Remove Forward Service Door Hinge.

NOTE: For ease of installation, bag and tag all loose hardware during removal.

(1) Remove door assembly from airplane. (Refer to Removal/ Installation Forward Service Door.)

(2) Remove door interior control handle. (Refer to 52-1-0.)

(3) Remove door interior trim and necessary soundproofing. (Refer to Chapter 25, EQUIPMENT/FURNISHINGS.)

(4) Remove slide tube and pulley bracket access door on top forward interior surface of door.

(5) Remove top attach bolt on counterbalance spring.

(6) Loosen nuts on cable hooks at cable quadrant and disconnect cables.

(7) Remove cable pulley on upper slide tube and pulley bracket.

(8) Remove nut and bolt securing slide tube to upper slide tube and pulley bracket.

(9) Remove snap ring and cable pressure seal from upper slide tube and pulley bracket.

(10) At upper slide tube and pulley bracket, remove bolts, nuts, and washers securing bracket to door structure.

(11) Slide upper slide tube and pulley bracket off end of slide tube.

(12) Remove cable midpoint ball retainers or safety wire door control plate; remove cable midpoint ball from slot in door control plate.

(13) Raise slide tube up and out of lower slide tube and pulley bracket.

(14) Remove door hinge and slide tube from door.

(15) Remove slide tube from door hinge arm fittings.

(16) Remove cotter pin, washer, and pin attaching hinge fairing link to door control plate.

Figure
Detail

(17) Cut lockwire and remove nut, washer, and spacer securing door control plate to door lower hinge arm; remove door control plate.

C. Install Forward Service Door Hinge.

NOTE: Steps (1) through (4) apply only to installation of a new door hinge, or replacement of the hinge arm pivot fittings within the fuselage hinge boxes. These steps may be omitted if original hinge and hinge arm pivot fittings are being reinstalled.

(1) With door removed from hinge, temporarily install door hinge in the fuselage hinge boxes. (Refer to Removal/Installation Forward Service Door, steps C.(1) through C.(5).)

(2) Rotate door hinge to the open position.

(a) Measure clearance between the upper hinge arm pivot fitting and pivot bolt washer at each fuselage hinge box. Clearance shall be 0.032 inch maximum. F

(b) Add or remove shims between the hinge arm pivot fittings and the fuselage hinge boxes to obtain proper clearance.

(3) Rotate door hinge to the closed position.

(a) Add or remove washers under heads of the hinge guide bolts to obtain 0.005 to 0.020-inch clearance between bolthead and the fuselage hinge box guides. G

(b) If necessary trim the fuselage hinge box guides to obtain correct clearance.

(c) Remove or add hinge bumper shims as required to make hinge fair in with fuselage in the door-closed position.

NOTE: There shall be a minimum of one shim installed at each bumper location.

(d) Clearance between hinge arms and the fuselage skin shall be 0.063 (+0.000, -0.030) inch. Trim hinge as required.

Figure
Detail

(4) Remove door hinge from the fuselage hinge boxes.

(5) Insert shank of door control plate through lower hinge arm fitting with threaded end towards the upper hinge arm. — E

(a) Install spacer, washer, and nut.

(b) Torque nut 10 to 20 inch-pounds and lockwire.

(6) Install pin, washer, and cotter pin connecting hinge fairing link to the door control plate. — D

(7) Lubricate slide tube with grease, Specification MIL-7421. Insert slide tube through the hinge arm fittings, with bolt hole at the top.

(8) Position door hinge and slide tube in door.

(9) Engage midpoint ball of operating cable in the door control plate slot and safety wire.

NOTE: Longest section of cable, measured from the midpoint ball, routes through the upper cable pulley.

(10) Install cable pulley on upper slide tube and pulley bracket.

(11) Install slide tube and pulley bracket on upper end of slide tube.

(12) Using a clean cloth dampened with aliphatic naphtha, clean slide tube plug and inside surface of the upper end of the slide tube.

(13) Apply EC1293 sealer, or equivalent, to slide tube plug and insert plug in upper end of slide tube. Align bolt hole through plug, slide tube, and bracket.

NOTE: Steps (12) and (13) to be omitted except for new slide tube installation.

(14) Install bolt and nut securing slide tube to upper slide tube bracket.

(15) Install upper slide tube and pulley bracket to the door structure.

Figure
Detail

(16) Install top attach bolt on counterbalance spring.

(17) Install snap rings and cable pressure seal in upper slide tube and pulley bracket.

(18) Connect cable ends to cable quadrant. Lock wire cable hooks in hook slots of quadrant. A

(19) Temporarily reinstall the door interior control handle. (Refer to 52-1-0.)

(20) With the door control handle in the open position, check clearance between the lower surface of the door control plate and top of the bolt retainers in the bottom of the slide tube well.

(a) Control plate shall clear bolt retainers. Adjust cable hooks to provide this clearance.

(b) Tighten cable hook nuts sufficiently to remove all slack in the operating cable.

(21) Check clearance between edge of the door control plate and rub strips inside the slide tube well for full distance of travel. H

NOTE: The interlock mechanism actuating pin on forward edge of door must be manually actuated in order to operate door mechanism.

(a) Minimum permissible clearance is 0.005 inch through full travel. The last one-inch travel to the full up position shall be within 0.005 to 0.020 inch.

(b) Add or remove shims behind rub strips to obtain proper clearance.

(22) Install slide tube and pulley bracket access door on top forward interior surface of door.

(23) Install door assembly on airplane. (Refer to Removal/ Installation Forward Service Door.)

4. Removal/Installation Forward Service Door Pin Receptacle Drain Adapter (see Figure 403)

A. Equipment Required - None.

B. Remove Door Pin Receptacle Drain Adapter.

(1) Remove tread plate and carpet on floor panel inboard of door threshold. (Refer to Chapter 25, EQUIPMENT/FURNISHINGS.)

(2) Remove floor panel inboard of door threshold.

(3) Remove clamp attaching drain hose to bottom of drain adapter (cup).

(4) Remove two screws attaching cup to drain receptacle tube.

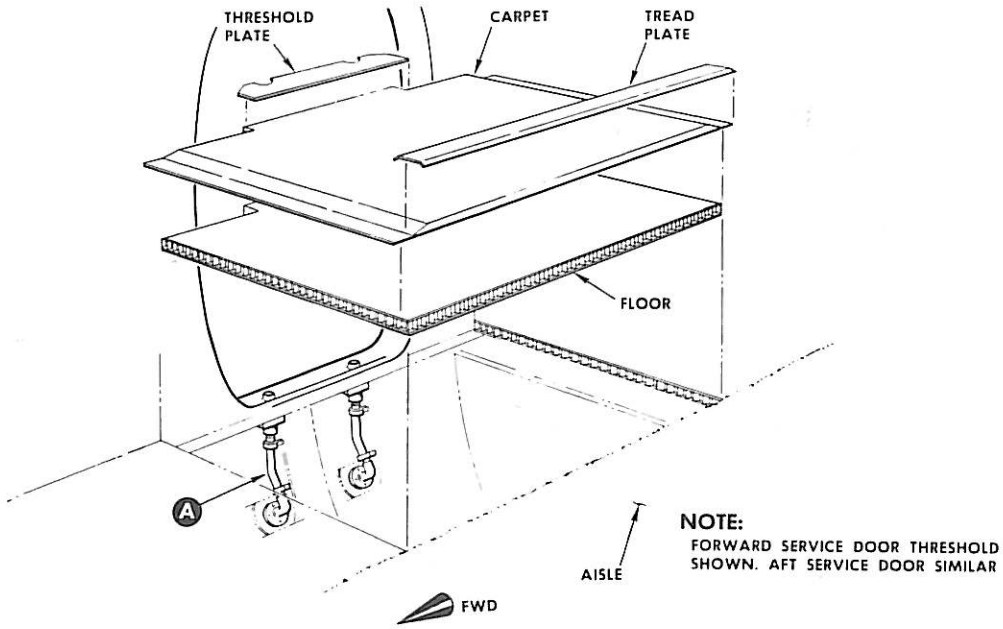
(5) Remove drain cup.

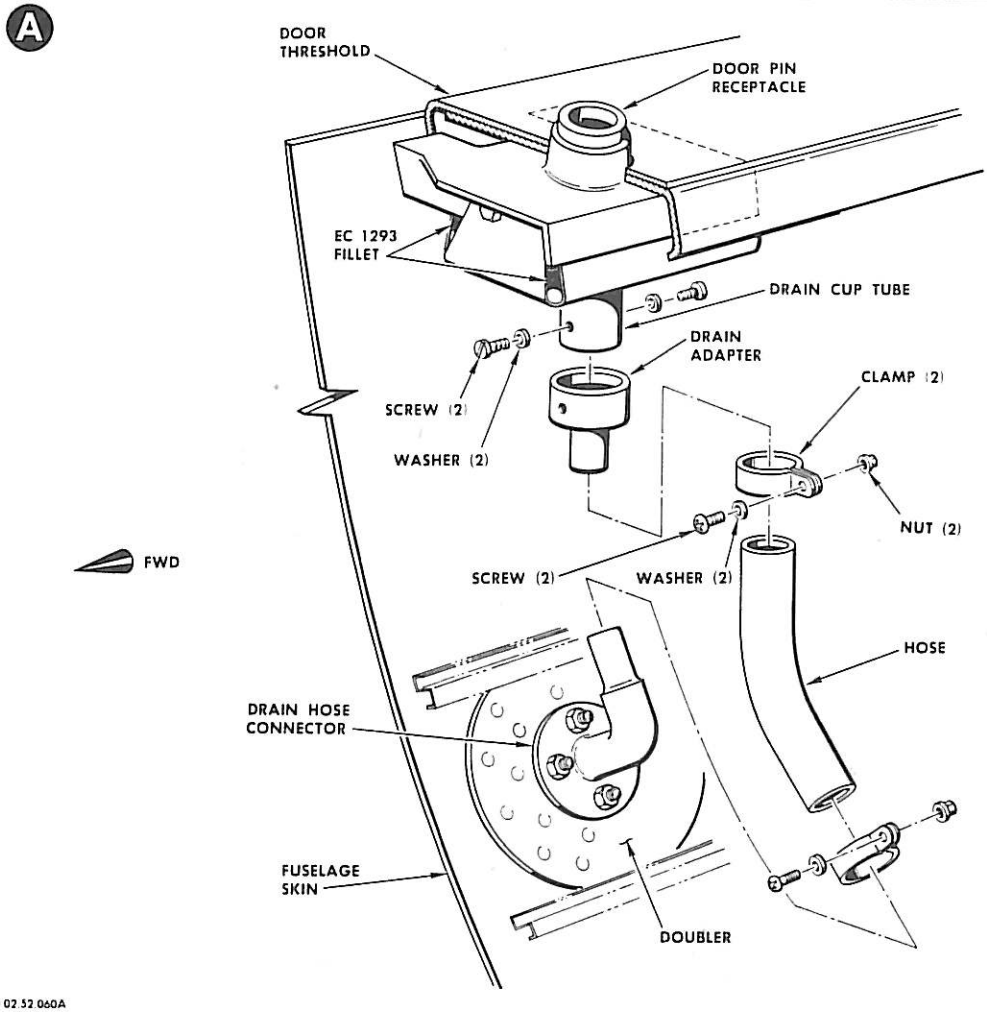
C. Install Door Pin Receptacle Drain Adapter.

(1) Install two screws attaching cup to drain receptacle tube.

(2) Slide drain hose over lower end of drain cup and install clamp.

(3) Install floor panel inboard of door threshold, install carpet. (Refer to Chapter 25, EQUIPMENT/FURNISHINGS.)





Service Door Pin Receptacle Drain Adapter Installation
Figure 403

FORWARD SERVICE DOOR - ADJUSTMENT/TEST

1. Adjustment/Test Forward Service Door (See Figure 501) — Figure Detail

NOTE: All of the following steps apply after installation of a new door, new hinge, or reinstallation of a door where slide tube, pulley brackets, or door hinge have been removed or disturbed. On door adjustments where slide tube, pulley brackets, or door hinge have not been removed or disturbed, the steps marked by an asterisk * need not be accomplished.

A. Equipment Required.

(1) Calibrated cable tensiometer capable of measuring tension loads of 270 to 770 pounds.

(2) Spring scale or torque wrench with special adapter (Convair TSTO 22-57156, which fits over the inner handle hub).

(3) Wood block, two inch thick.

B. Adjust Forward Service Door.

CAUTION: WHEN CLOSING DOOR NEVER ALLOW DOOR TO FREE FALL INTO DOOR OPENING; DAMAGE TO DOOR HINGE MECHANISM MAY OCCUR. MANUALLY ASSIST DOOR INTO CLOSED POSITION. DO NOT RESTRAIN DOOR AT INNER HANDLE, BUT ON AFT SIDE OF DOOR INNER SURFACE.

(1) Slowly swing door outward and forward until the door hinge-stop linkage bottoms out.

NOTE: When the door hinge-stop linkage bottoms out the door hold-open hook should engage stop linkage.

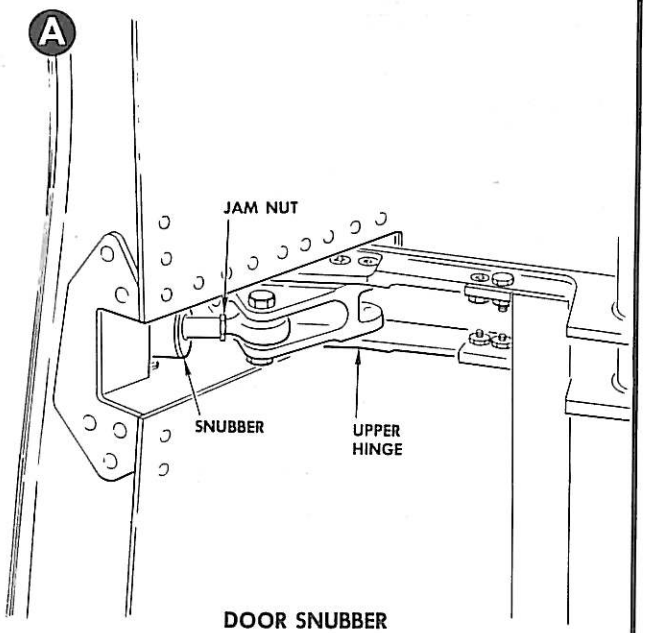
(a) Move door aft until hinge is near midpoint of full travel. Loosen jam nut on snubber piston shaft and rotate shaft to lengthen, until retracted snubber piston is felt to bottom, while moving door gently about midpoint of travel. Shorten snubber piston shaft by rotating one full turn; retighten jam nut. Slowly rotate door to fully opened and fully closed positions to determine that snubber is not bottoming at extremes of travel. — A

(2) Check the exterior door handle fair-in; refer to 52-1-0.

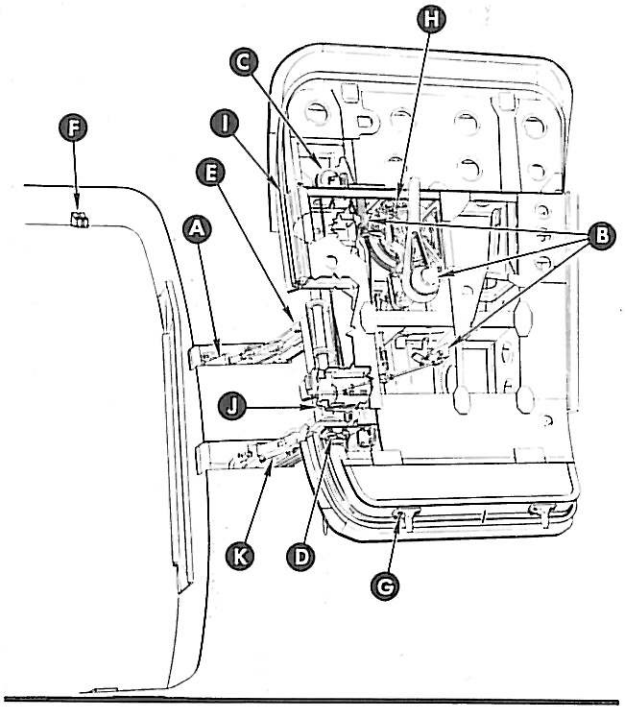
(3) Remove the interior door control handle; refer to 52-1-0.

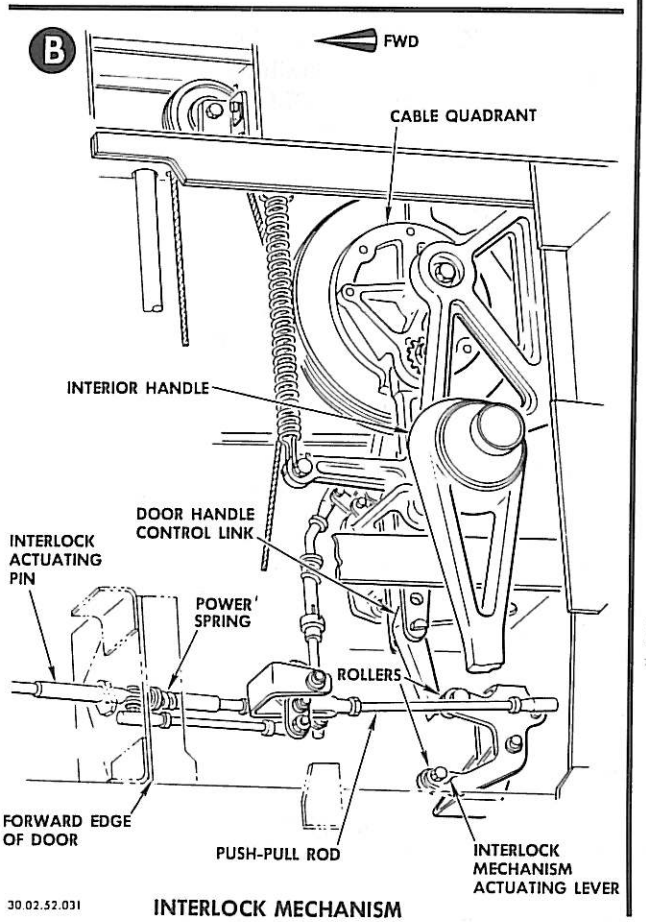
(4) Remove interior trim and necessary soundproofing as directed in Chapter 25, EQUIPMENT/FURNISHINGS.

(5) Temporarily reinstall interior door handle to accomplish door adjustments.



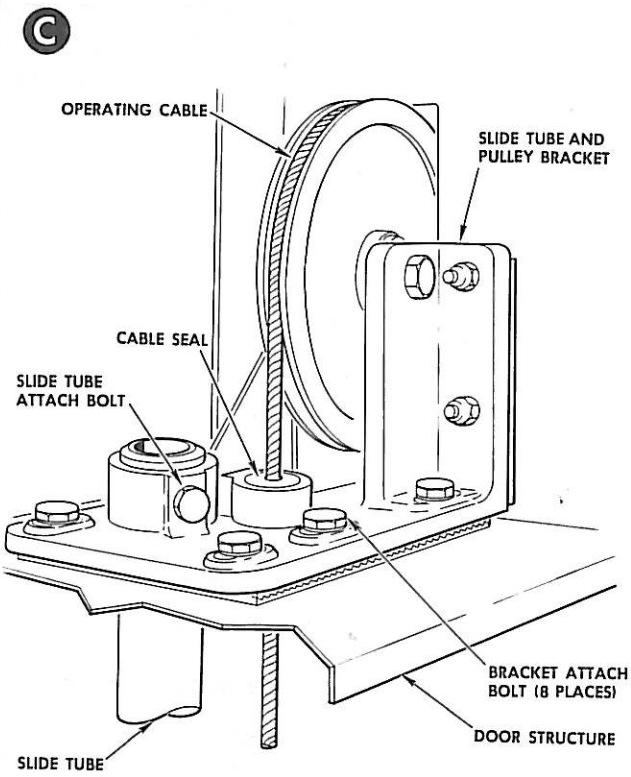
DOOR SNUBBER





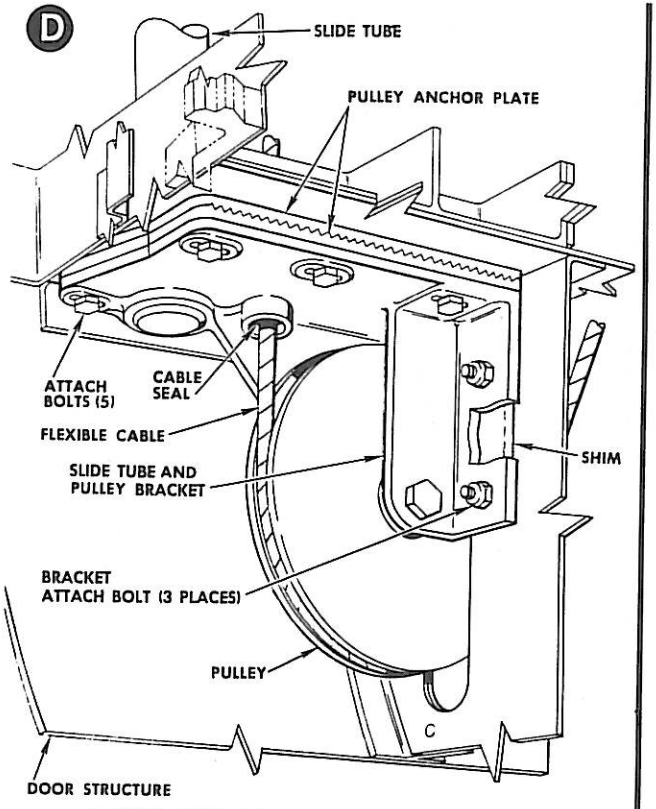
30.02.52.031

INTERLOCK MECHANISM



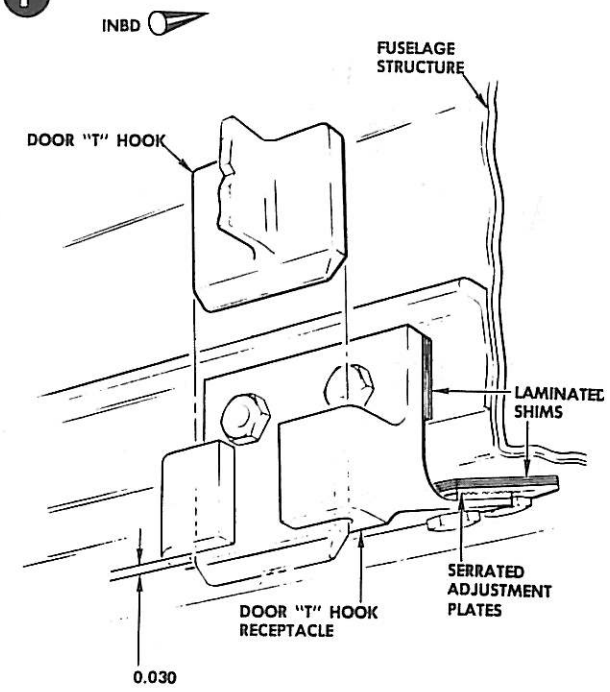
UPPER SLIDE TUBE AND PULLEY BRACKET

D



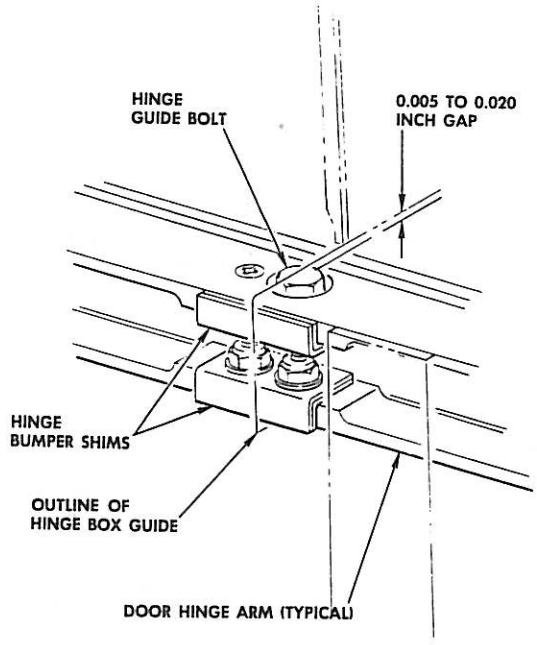
LOWER SLIDE TUBE AND PULLEY BRACKET

F



DOOR UPPER "T" HOOK AND RECEPTACLE

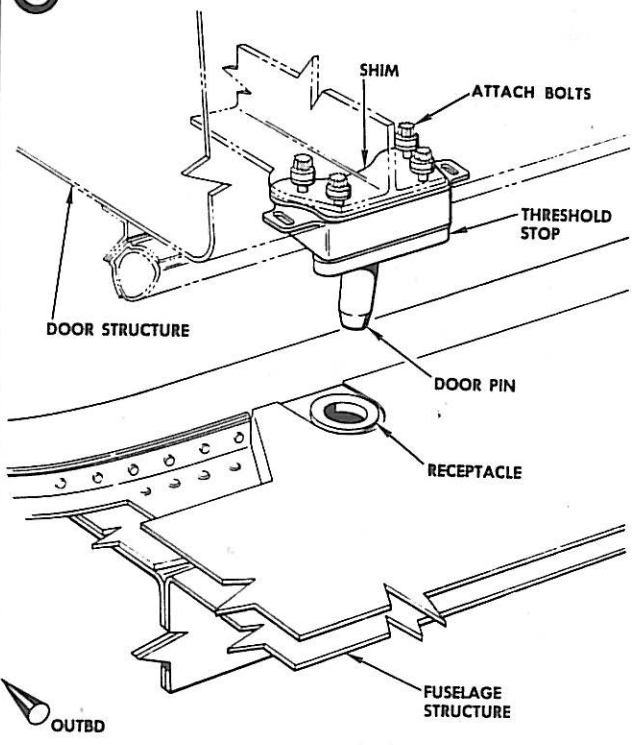
E



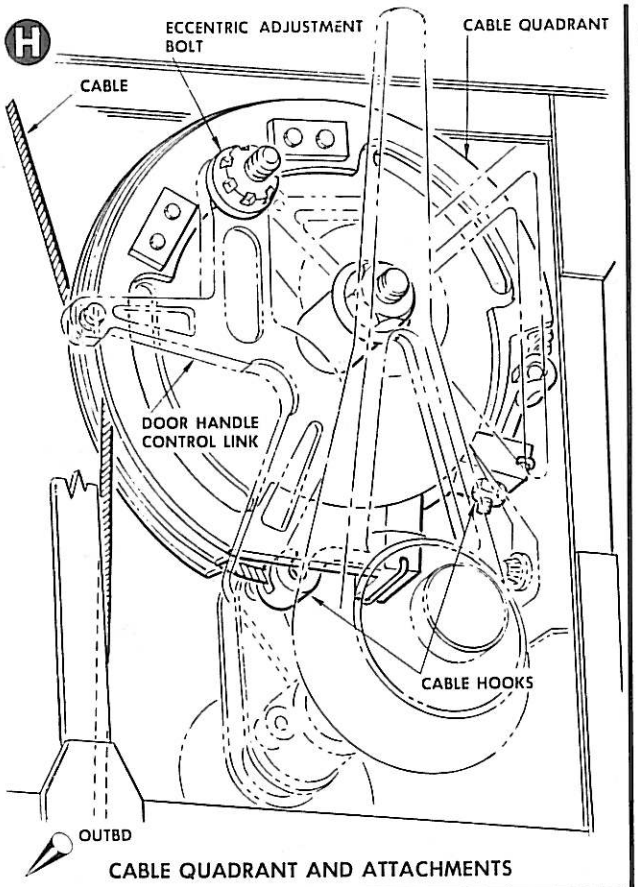
HINGE ARM TO HINGE BOX GUIDE CLEARANCE

30.02.52.030 A

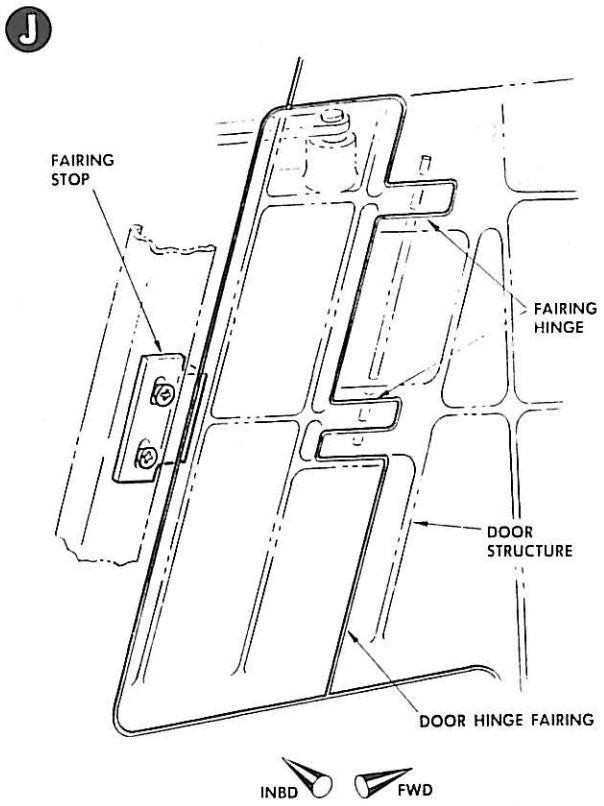
G



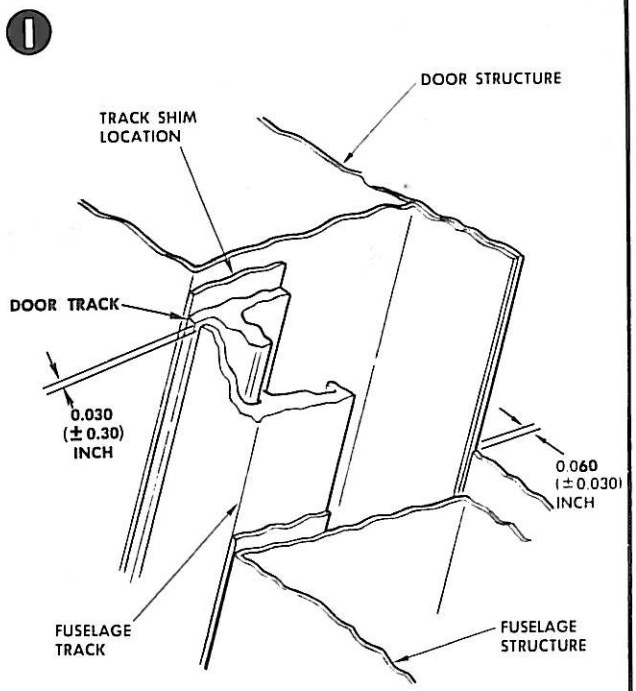
LOWER DOOR PIN AND RECEPTACLE



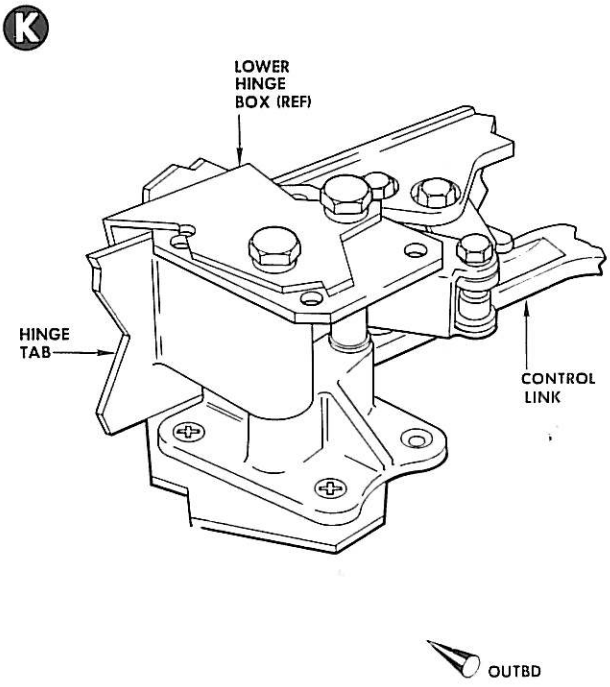
CABLE QUADRANT AND ATTACHMENTS



DOOR HINGE FAIRING AND STOP



DOOR TRACK CLEARANCE



DOOR HINGE ARM TAB LINKAGE

30.02.52.032

(6) To adjust door operating cable proceed as follows:

(a) Open door and place wood block between bottom of door and door threshold, lower to closed position until door weight is supported on wood block.

(b) Adjust lower portion of operating cable to a tension load of 450 (±20) pounds.

(c) Raise door and remove wood block.

(d) With door in the closed position, rotate handle to the full over-center and locked position.

(e) Adjust lower portion of operating cable to a tension load of 130 (±10) pounds. If cable tension exceeds given load limits, tighten upper cable hook and loosen lower cable hook. If cable tension is below given load limits, loosen upper cable hook and tighten lower cable hook (same number of turns at each cable hook).

(f) Repeat steps (a) and (b), 450 (±20) pounds tension must be maintained on lower portion of cable with door supported on wood block.

(7) Raise and rotate door outward to full open position, depress interlock mechanism actuating pin on forward edge of door and secure so that handle interlock pin is withdrawn from the door handle shaft.

(8) Disconnect the interlock mechanism push-pull rod from the interlock actuating lever at lower end of door handle control link.

CAUTION: DO NOT ROTATE DOOR HANDLE TO "CLOSED" POSITION WITH DOOR OPEN AND INTERLOCK MECHANISM DISCONNECTED; DAMAGE TO DOOR HINGE FAIRING WILL RESULT.

*(9) To accomplish this step, gain access to slide tube and pulley brackets by removing the two small access plates on the forward inner surface of door. Loosen bolts securing brackets at each end of the slide tube.

NOTE: Bolts are loosened to permit shifting of the slide tube assembly in a fore or aft direction to align door and prevent cocking as door lowers.

(10) Rotate door 30 degrees to open position (approximately) and check hinge clearances.

*Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.

Figure
Detail

(a) Remove or add washers under heads of hinge guide bolts to obtain 0.005 to 0.020-inch clearance between bolthead and the fuselage hinge box guides. — E

(b) If necessary, trim the fuselage hinge box guides to obtain correct clearance.

(c) Remove or add hinge bumper shims, as required, to make hinge fair in with fuselage in a door closed position.

NOTE: There shall be a minimum of one shim installed at each bumper location.

(11) Slowly lower door into the fuselage opening.

(a) Check door-to-fuselage skin clearances. For new doors, trim as necessary. Avoid excessive trim as final trim cannot be accomplished until after completion of slide tube adjustment.

(b) From inside the airplane, check alignment of the lower door pins and the upper "T" hooks with their respective receptacles as they begin to mesh.

CAUTION: DO NOT FORCE DOOR.

*(c) Shift slide tube brackets accordingly to accomplish door fore-and-aft alignment. — C & D

*(d) Measure inboard and outboard door hook and receptacle alignment at top of door. If misalignment exceeds 0.015 inch, or if skin gap along top of door exceeds 0.060 (±0.030) inch, open door and adjust the fuselage mounted "T" hook receptacles in an inboard or outboard direction. The receptacles are serrated to allow adjustment in increments of 0.032 inch. — F

NOTE: Shifting of the hook receptacles must be accompanied by varying the thickness of laminated shims at both attaching legs of "T" hook receptacles. Do not bend attaching legs of hook receptacles when tightening bolts. Shims are adjustable within 0.003 inch which is maximum gap permissible before tightening bolts.

*Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.

Figure Detail

*(e) Measure inboard and outboard misalignment at bottom of door. If misalignment exceeds 0.015 inch or if skin gap along bottom of door exceeds 0.060 (±0.030) inch, open door and add or remove shims behind attaching legs of the lower door pins. — G

NOTE: Inner door skin at bottom of door is secured with screws to provide access to door bottom edge pin attachments.

*(12) Repeat steps (11) (a) through (11) (e) until the lower door pins and the upper "T" hooks align with their receptacles within 0.015 inch in all directions. The 0.015 inch dimension is taken at the full width section of the hooks and pins. — F & G

(13) Lower door until the threshold stops on the lower door pins contact the pin receptacles. If gap between receptacle and threshold stop is greater than 0.030 inches, adjust nuts on the operating cable hooks to allow door to bottom fully on the threshold stops. Recheck cable tension as directed in step (6). — G & H

NOTE: Door shall contact both stops at the same time.

*(14) Continue motion of the door handle until it overcenters.

(a) Check that full width section of the upper door "T" hooks extend through their receptacles a minimum of 0.030 inch. Add or remove shims behind the threshold stops on the lower door pins as required. — F & G

NOTE: Amount of shim adjustment must be rationalized between satisfying 0.030-inch door hook and receptacle adjustment, permissible skin clearance and simultaneous contact at both door lower pin stops.

*(b) Check gap at door tracks on forward and aft edges of door. Gap shall be 0.030 (±0.030) inch at any portion of track, both sides of door with door closed and locked (cinched down). — I

*Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.

Figure
Detail

*NOTE: When the door is closed and locked (cinched down), the door may shift to one side causing the track clearance on one edge of door to exceed the 0.030 (±0.030) inch dimension; however, this clearance shall not exceed the sum of the maximum track clearances for both edges of door. Door tracks may be shimmed up to 0.060 inch maximum to obtain correct clearance.

WARNING: DO NOT FILE TRACKS.

*(15) With door fully closed, make final adjustment to slide tube brackets at each end of the slide tube. Brackets are serrated for adjustments in increments of 0.032 inch. C & D

(a) Door shall clear fuselage skin 0.060 (±0.030) inch; trim as necessary. I

NOTE: Fuselage skin clearance shall exceed track gap.

(b) For allowable mismatch between door and fuselage skin; refer to Figure 502.

NOTE: A maximum of one tapered shim, tapered 0.030 to 0.060 inch in a forward or aft direction, or tapered in an inboard or outboard direction may be installed between each lower door pin and the door structure to assist alignment. Use shims only if necessary to align door pins with their receptacles.

(c) Adjust door operating cable as directed in step (6).

(16) Rotate door handle toward the OPEN position.

(a) Door shall begin to lift at 8.5 (approximately) degrees minimum handle rotation.

(b) With door fully raised and open, check for clearance between lower surface of door control plate and top of bolt retainers in bottom of slide tube well.

(17) Adjust nylon hinge fairing stop on the forward inner surface of the door to hold the hinge fairing in contour when door is in the fully closed position. J

*Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.

Figure
Detail

NOTE: The hinge fairing stop is slotted to permit adjustment.

(18) Adjust the lower hinge arm tab fairing.

(a) Vary quantity of washers between stop linkage and the hinge tab adjustable lever to fair in tab with contour of fuselage. K

NOTE: One washer may be tapered as required to prevent bending the hinge tab adjustable lever.

(19) Free the interlock mechanism and reconnect the aft push-pull rod of the interlock mechanism to the interlock actuating lever at the lower end of the door handle control link. B

(20) With door fully raised and open, adjust the interlock mechanism to meet the following conditions:

(a) Handle interlock pin is fully inserted into handle shaft.

(b) Interlock actuating pin on forward edge of door is fully extended. Switch pin on fuselage door frame should be extended 0.2 inch.

(c) With door closed and inner handle overcenter and bottomed out, upper roller on the interlock mechanism actuating lever should contact door handle control link. If link does not contact roller, lengthen handle latch push-pull rod and, to compensate, shorten interlock pin push-pull rod.

CAUTION: WHEN CLOSING DOOR NEVER ALLOW DOOR TO FREE FALL INTO DOOR OPENING; DAMAGE TO DOOR HINGE MECHANISM MAY OCCUR. MANUALLY ASSIST DOOR INTO CLOSED POSITION. DO NOT RESTRAIN DOOR AT INNER HANDLE, BUT ON AFT SIDE OF DOOR INNER SURFACE.

(21) Raise door carefully and swing out from opening. Check that door handle is locked to prevent lowering of door when the door is approximately 20 degrees out of the opening.

CAUTION: IN THE EVENT THE INTERLOCK MECHANISM DOES NOT ENGAGE IN DOOR HANDLE SHAFT, DO NOT LOWER DOOR; DAMAGE TO THE HINGE FAIRING WILL RESULT.

(22) Swing door closed and lower carefully. Check that the interlock actuating pin on forward side of door extends below interlock hook on door jamb.

CAUTION: WHEN CLOSING DOOR, NEVER ALLOW DOOR TO FREE FALL INTO DOOR OPENING; DAMAGE TO DOOR HINGE MECHANISM MAY OCCUR. MANUALLY ASSIST DOOR INTO CLOSED POSITION. DO NOT RESTRAIN DOOR AT INNER HANDLE, BUT ON AFT SIDE OF DOOR INNER SURFACE.

(23) To check door handle operating loads proceed as follows:

(a) With interior trim panel removed, place door in the closed and locked position.

(b) Using a spring scale, or torque wrench with special adapter made to fit inner handle hub, check door handle operating loads. Using a spring scale, handle loads shall not exceed 50 pounds through full range of travel with trim panel removed or 70 pounds with trim panel installed. Using a torque wrench with special adapter, handle loads are measured in foot-pounds; 50 foot-pounds through full range of travel with trim panel removed or 70 foot-pounds with trim panel installed.

NOTE: If spring scale is used handle loads are measured perpendicular to a point 10 inches from center of handle shaft, in direction of rotation.

*(24) When hinge assembly or door assembly has been replaced, reinstall the slide tube and pulley bracket access doors on the interior surface of the door.

(25) Remove the interior door handle and reinstall the soundproofing and door interior trim; Refer to Chapter 25, EQUIPMENT/FURNISHINGS.

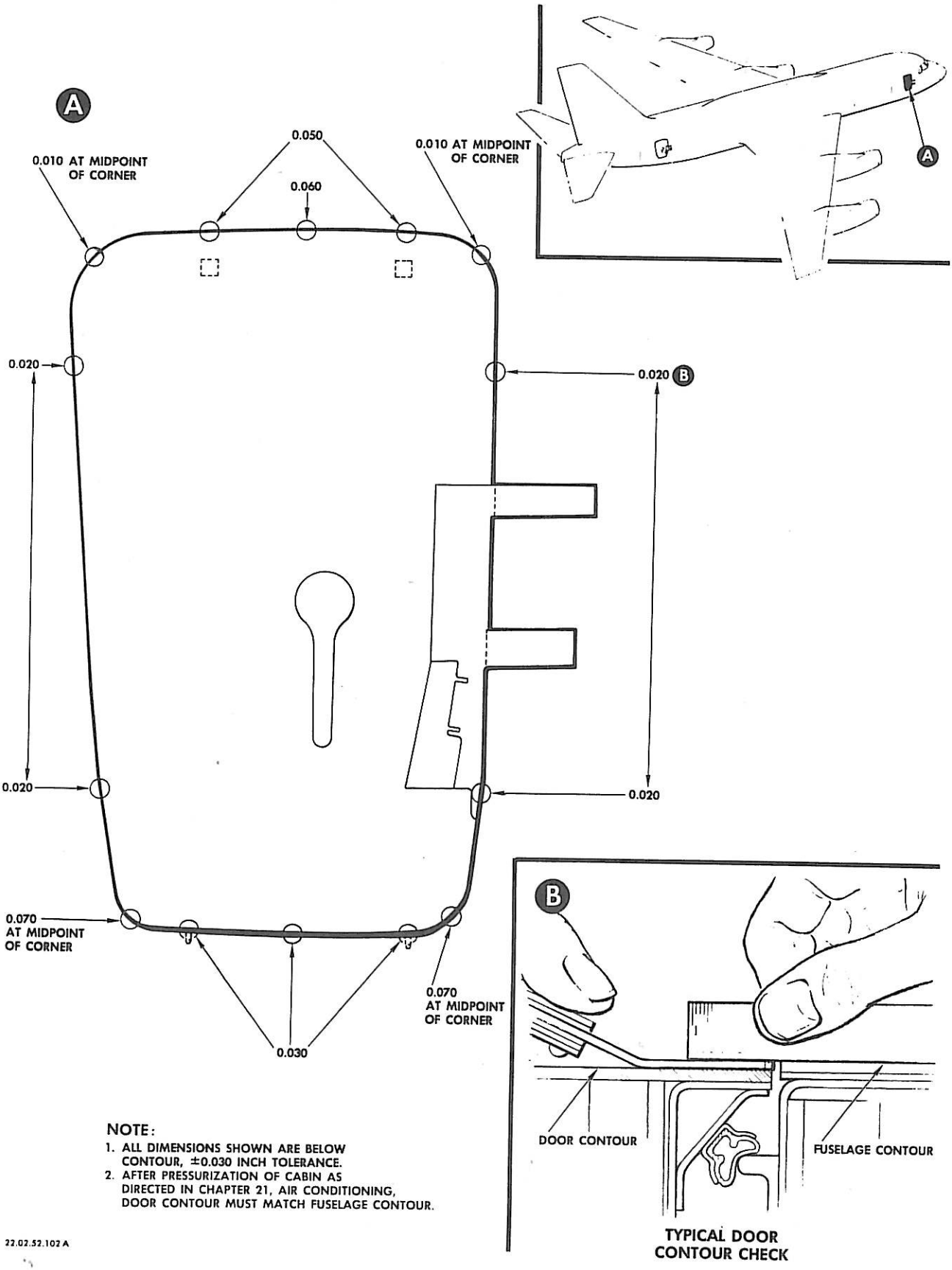
(26) Reinstall the interior door handle; Refer to 52-1-0.

(27) Adjust door microswitch; Refer to 52-6-0.

(28) Accomplish door Inspection/Check.

*(29) When door assembly has been replaced with a new door, pressurize fuselage cabin to normal operating pressure as directed in Chapter 21, AIR CONDITIONING. Recheck mismatch between door and fuselage skin; refer to Figure 502.

*Asterisk indicates steps not required where slide tube, pulley brackets, or door hinge have not been removed or disturbed.



NOTE:
1. ALL DIMENSIONS SHOWN ARE BELOW CONTOUR, ±0.030 INCH TOLERANCE.
2. AFTER PRESSURIZATION OF CABIN AS DIRECTED IN CHAPTER 21, AIR CONDITIONING, DOOR CONTOUR MUST MATCH FUSELAGE CONTOUR.

22.02.52.102 A

TYPICAL DOOR CONTOUR CHECK

FORWARD SERVICE DOOR - INSPECTION/CHECK

1. Inspection/Check Forward Service Door Assembly

A. Equipment Required - Spring scale or torque wrench with special adapter (Convair TSTO 22-57156) which fits inner handle hub to measure interior door handle operating loads. Spring scale also needed to check door snubber.

B. Procedure.

(1) With door closed, rotate the interior door handle approximately 180 degrees to the OPEN position.

(a) Door shall raise and control handle shall bottom out in the overcenter position.

(b) Door shall remain raised without applying external force.

(2) Rotate door to full open position.

(a) Door shall swing out until hinge-stop linkage is fully extended and bottomed. Slowly rotate door to fully open and fully closed positions to determine that door snubber piston is not bottoming at extremes of travel. If proper snubber operation is questionable, check snubber as follows:

Disconnect snubber piston rod end from door hinge.

With snubber piston retracted, apply a constant 51 pound pull to piston rod end with spring scale and record time for piston to travel from fully retracted to fully extended position. Piston travel time should be a minimum of 12 seconds and a maximum of 50 seconds.

(b) Rotate interior door handle toward the closed position. The door interlock mechanism shall prevent handle movement.

CAUTION: IN THE EVENT THE INTERLOCK MECHANISM IS NOT ENGAGED IN THE DOOR HANDLE SHAFT DO NOT ALLOW DOOR TO LOWER; DAMAGE TO HINGE FAIRING WILL RESULT. REFER TO DOOR ADJUSTMENT/TEST PROCEDURE.

(c) Hold-open hook shall engage in the hinge-stop linkage.

(d) Pull edge of door toward the closed position. Hold-open hook shall prevent door closing.

(e) Actuate hold-open hook toward door opening. Hook shall toggle into position freeing the hinge-stop linkage for movement.

(3) Rotate door into fuselage opening and slowly rotate the interior door handle to CLOSED position.

CAUTION: WHEN CLOSING DOOR NEVER ALLOW DOOR TO FREE FALL INTO DOOR OPENING; DAMAGE TO DOOR HINGE MECHANISM MAY OCCUR. MANUALLY ASSIST DOOR INTO CLOSED POSITION. DO NOT RESTRAIN DOOR AT INNER HANDLE, BUT ON AFT SIDE OF DOOR INNER SURFACE.

(a) As door lowers, check alignment of the lower door pins and the upper "T" hooks with their respective receptacles as they begin to enter.

(b) As door reaches the fully closed position, it should bottom on the threshold stops (maximum allowable gap 0.030 inch) and the door handle shall rotate overcenter.

(c) The interlock actuating pin on forward edge of door shall extend below hook on door jamb sufficiently to actuate door-open warning microswitch.

(d) The door open-warning microswitch plunger shall be depressed 0.210 inch maximum when the interlock mechanism actuating pin reaches its fully extended position.

(e) Door seal shall contact striker around entire periphery of door.

(f) For allowable mismatch between door and fuselage skin; refer to Adjustment/Test. Door shall clear fuselage skin 0.060 ($\pm$0.030) inch.

(g) The exterior door handle shall be flush with the exterior skin of door.

(4) Check interior door handle loads with spring scale or torque wrench. Handle load shall not exceed 50 pounds through full range of travel with trim panel removed (70 pounds with trim panel installed).

NOTE: If spring scale is used, load on handle is measured perpendicular to a point on handle centerline 10 inches from center of handle hub, in direction of handle rotation.

(5) Check lower operating cable tension; refer to Adjustment/Test for procedure.

(6) Repeat steps (1) through (3) (g) except use the exterior door handle.

(7) Rotate the interior door handle to the OPEN position, then rotate the exterior door handle to OPEN position.

(a) At OPEN position the exterior door handle shall engage the interior door handle.

(8) Close door using the exterior door handle.

CAUTION: WHEN CLOSING DOOR NEVER ALLOW DOOR TO FREE FALL INTO DOOR OPENING; DAMAGE TO DOOR HINGE MECHANISM MAY OCCUR. MANUALLY ASSIST DOOR INTO CLOSED POSITION. DO NOT RESTRAIN DOOR AT INNER HANDLE, BUT ON AFT SIDE OF DOOR INNER SURFACE.

REAR SERVICE DOOR - DESCRIPTION AND OPERATION

1. General

The rear service door (see Figure 1) is approximately 24 x 48 inches in size and is located on the aft right side of the passenger compartment between fuselage stations 1378 and 1408. It is directly opposite the rear main entrance door and may be opened from either inside or outside the cabin. Sealing around the door is provided by a molded bulb type wire-reinforced pressure seal that is energized by cabin pressure.

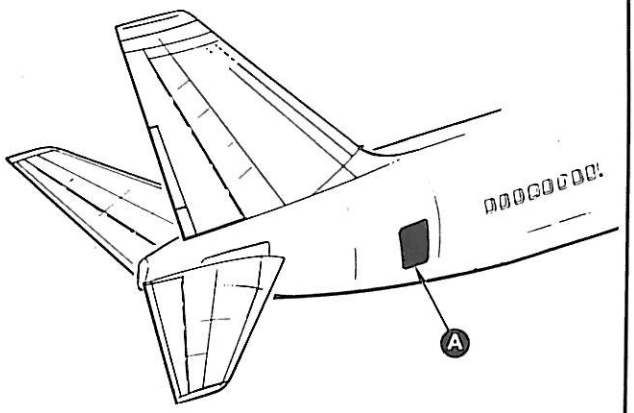
2. Structure

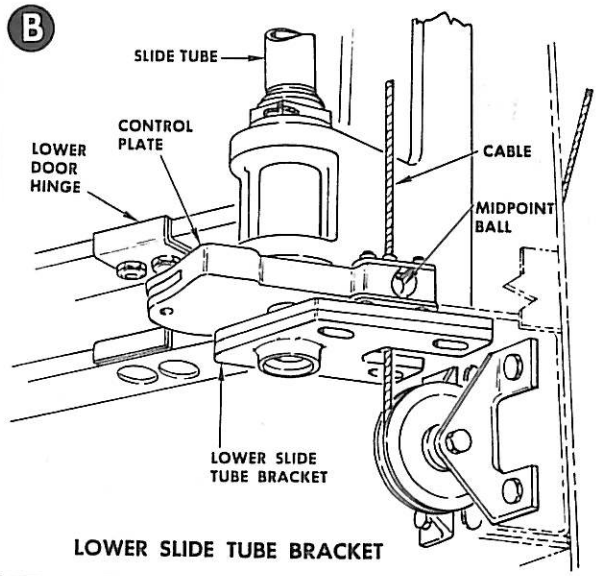
The rear service door structure is similar to that in the main entrance doors and forward service door, utilizing conventional rib and skin construction and 2024 and 7075 aluminum alloy throughout. Construction consists of an outside frame with interconnecting horizontal and vertical ribs. The outer skin is riveted to and forms an integral part of the door frame and rib structure. Partial inner skins enclose part of the rib structure and form a vertical torque box along the forward and aft portion of the door and at the top and bottom. The door handles are cast magnesium and the door operating mechanism supports are aluminum castings. The interior surface of the door is covered with an acoustical material, and is trimmed compatible with the decor of the airplane interior.

Rear service door restrainment is the same as the forward service door; no stub tracks are used. Continuous vertical tracks approximately 27 inches long are bolted to the forward and aft edges of the door. Moly black epoxy top coating has been added to the door tracks for chafe prevention. Refer to Chapter 51, STRUCTURES - GENERAL, for application procedure. Two round door pins are located on the bottom edge of the door, and two "T" hooks are located along the upper edge. An adjustable door stop, positioned by laminated shims, is provided on each of the bottom edge door pins. These stops contact the fuselage threshold and limit vertical travel of the door into the tapered fuselage opening. The "T" hooks on the upper edge of the door mate with receptacles in the fuselage. These receptacles are adjustable inboard and outboard through a serrated horizontal plate. Laminated shims are installed behind the vertical attach leg of these receptacles to compensate for inboard and outboard adjustment.

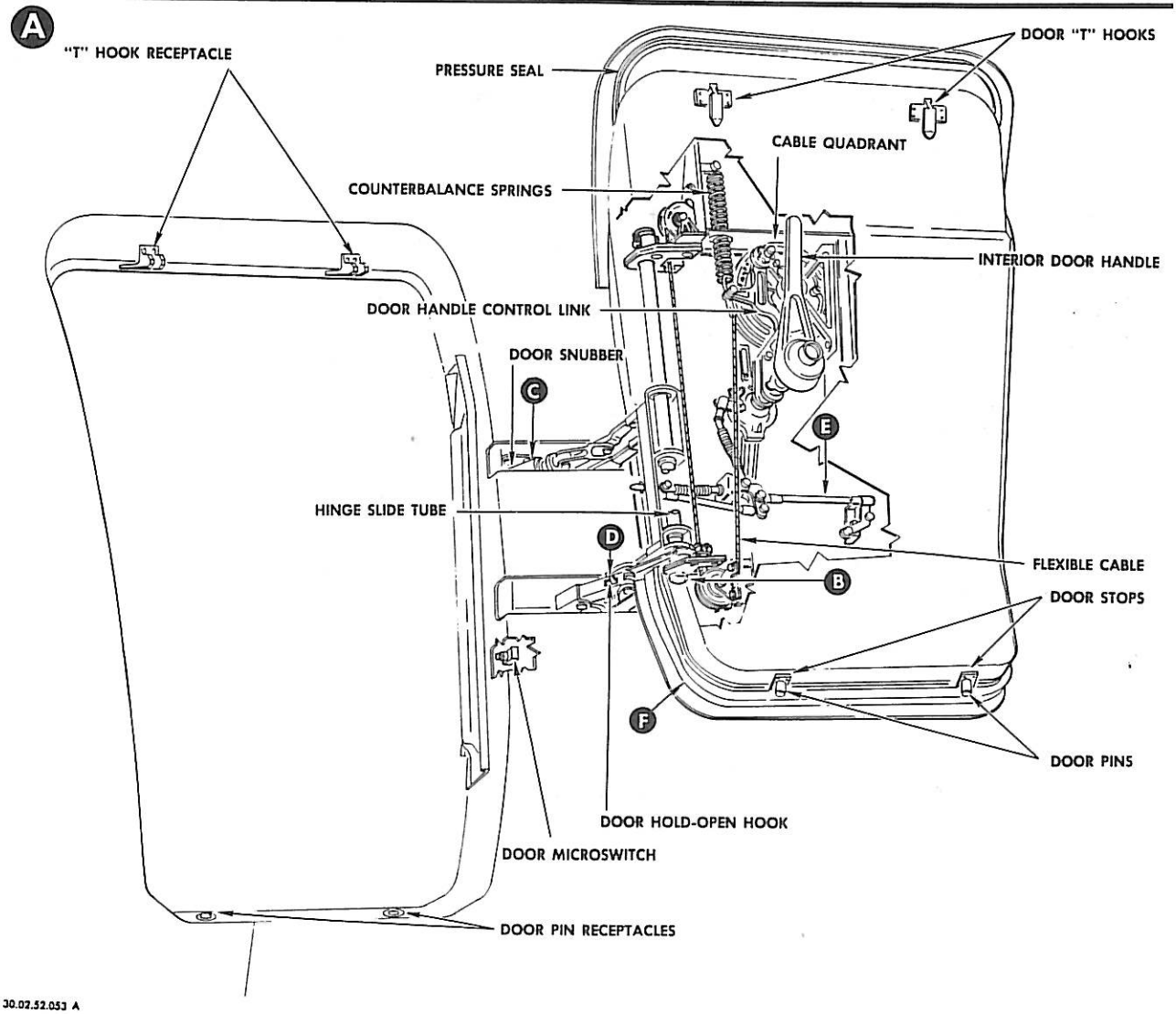
3. Door Operating Mechanism

The door operating mechanism on the rear service door consists of an exterior and interior door control handle, door handle control link, cable quadrant, door control plate, a counterbalance spring, a flexible operating cable, a hinge slide tube, and articulating hinge linkages. Also included is a door interlock mechanism, a spring-loaded door hold-open hook, a door snubber, and an upper and lower cable seal.



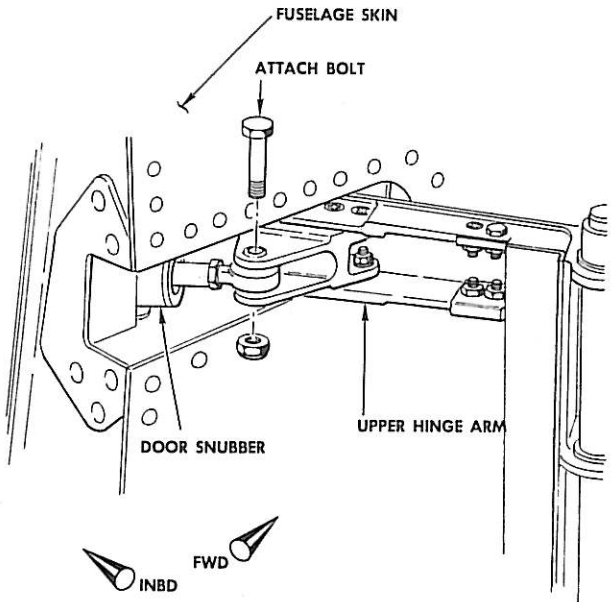


LOWER SLIDE TUBE BRACKET



30.02.52.053 A

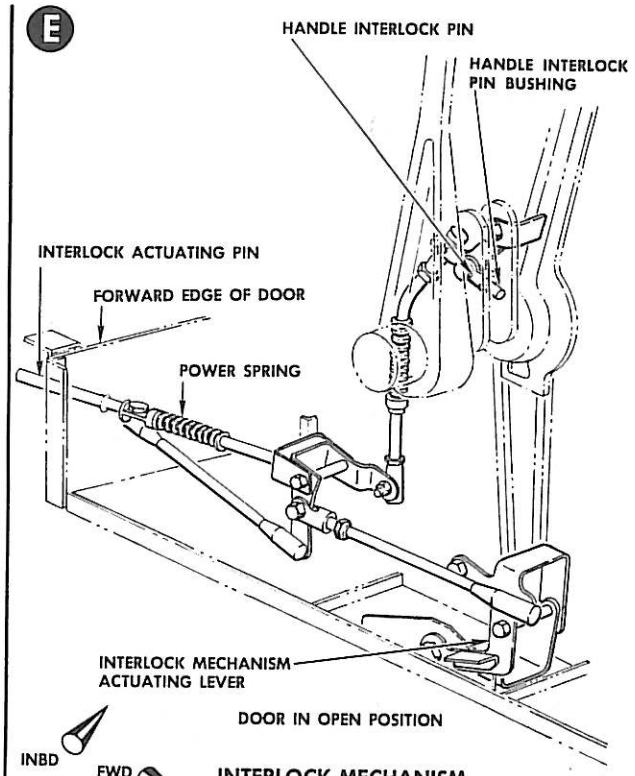
C



DOOR IN OPEN POSITION

DOOR UPPER HINGE ARM

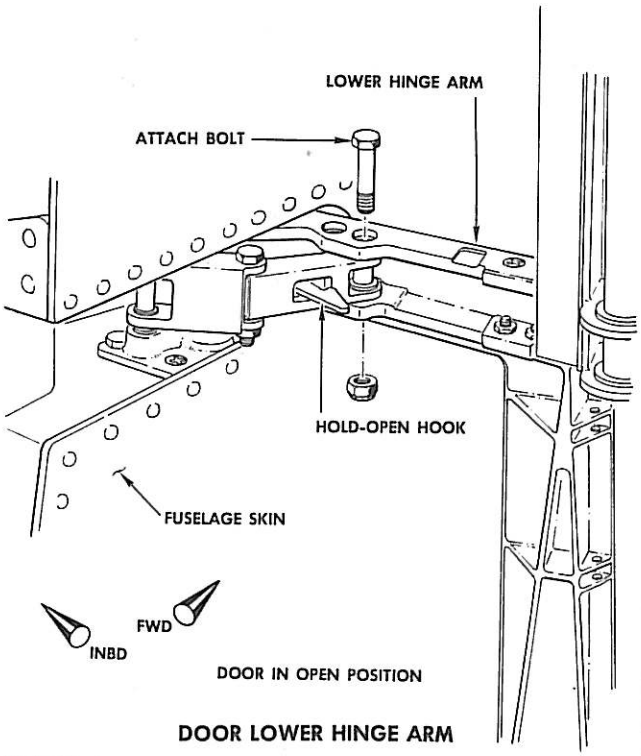
E



DOOR IN OPEN POSITION

INTERLOCK MECHANISM

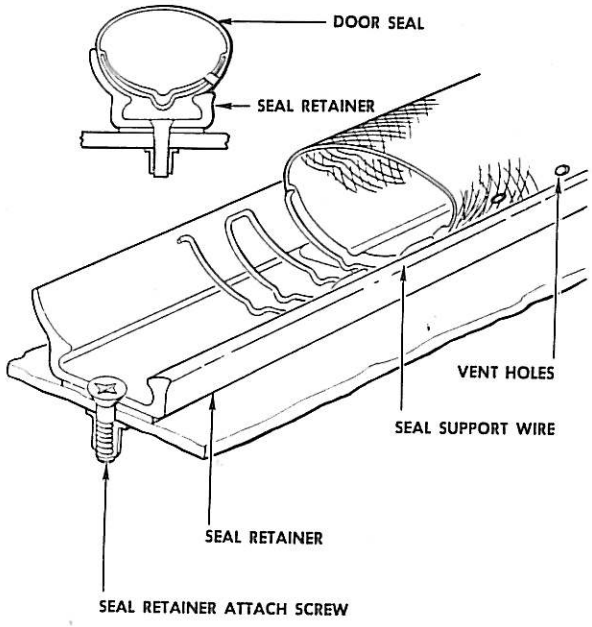
D



DOOR IN OPEN POSITION

DOOR LOWER HINGE ARM

F



DOOR PRESSURIZATION SEAL

22.02.52.055-2 B

The exterior door handle on the rear service door is recessed into the door, flush with the exterior surface of the airplane, and is installed on a coaxial shaft with the interior door handle. The interior door handle operates independently of the exterior door handle; however, operation of the exterior handle results in movement of the interior handle. Door handle rotation is transmitted through the door handle control link to the cable quadrant. Each end of the flexible operating cable attaches to this cable quadrant. A swedged ball near the operating cable midpoint secures the cable in a recess in the door control plate at the door lower hinge arm attachment. This operating cable, being attached to the door control plate and the cable quadrant, provides the effecting means by which the door is raised, lowered, and locked into overcenter positions. The counterbalance spring aids in balancing the door weight as the door is raised, and provides a force for holding the mechanism overcenter in the fully open and closed positions.

The articulating hinge on the door will pivot so as to place the door forward of the door opening and parallel to the fuselage in the full open position. A snubber is mounted at the door upper hinge box and attaches to the door upper hinge arm to dampen the inertia forces of the door opening and closing. The hold-open hook and hinge-stop linkage are located at the door lower hinge arm and prevent the door from inadvertently closing or coming into contact with the fuselage when open.

The door operating mechanism is augmented by an interlock mechanism consisting of an interlock actuating pin on the forward edge of the door, door handle interlock pin, interlock mechanism actuating lever, power spring, and connecting push-pull rods and bell cranks. When the door is closed and locked, the interlock actuating pin on the forward edge of door extends below a hook retainer on the forward door jamb. This pin serves as a fail-safe pin which will engage the hook retainer in the event the cinch-down mechanism malfunctions. The interlock actuating pin prevents the door from inadvertently opening; it also actuates the door microswitch to control the associated door-open warning light (refer to 52-6-0). The door handle interlock pin latches the handle up when the door is swung out of the opening; it prevents lowering of the door with the door in the open position. The door handle control link of the door operating mechanism operates the interlock mechanism actuating lever and in turn sequences operation of the interlock actuating pin on the forward edge of the door. The power spring provides an actuating force to operate the interlock actuating pin.

A. Door Mechanism Operation.

A single 180 degree rotation of the exterior or interior door control handle raises the door vertically approximately nine inches to allow the door to be swung open. When opening the door from the outside, the exterior handle must be levered out of its recess before rotation can be initiated. Door handle extraction is accomplished by first depressing one end of a small lever in the handle. This action provides a projecting lever which may be gripped with the fingers. The door handle

may then be pulled sufficiently from its recess to permit grasping the door handle with the other hand. Pulling the exterior handle outboard engages a driving dog on the exterior door handle shaft with the interior door handle shaft and after initial rotation of the door handle, an outward pull is no longer necessary. The first 10 degrees of handle motion takes the door operating mechanism out of the overcenter configuration and retracts the interlock mechanism actuating pin on forward edge of door. The door microswitch located forward of the door opening in the fuselage structure deactuates and illuminates a warning light. Further rotation of the door control handle causes the door to rise, disengaging the upper door "T" hooks and the lower door pins that secure the door in the closed position.

At the completion of the nine-inch vertical travel (180 degrees of control handle rotation), the door tracks will clear the fuselage tracks, thus permitting the door to be pivoted outboard around the articulating hinge on the forward edge of the door. The overcenter action of the door operating mechanism will hold the door in the raised position. As the door is opened outward the interlock mechanism locks the door control handle shaft to prevent lowering of the door. The articulating hinge changes the pivot points of the door as it rotates to the full open position thus placing the door forward of the opening and parallel to the fuselage. Guidance of the door is not required as this is accomplished by the hinge mechanism.

A snubber at the door upper hinge arm dampens the inertia forces of the door when opening and closing. This snubber operates only during motion of the hinge and becomes increasingly more effective as the hinge approaches the fully open or fully closed position. The door is restrained in the full open position by the hinge-stop linkage on the door lower hinge arm which is locked with the hold-open hook. This hook need not be held for position as it is spring-loaded and has a snap action.

Closing the door is accomplished by reversing the door opening procedure; however, the hold-open hook must be manually released when closing the door. It is finger operated in a direction toward the fuselage. In the event the door handles are not engaged with each other when accomplishing the door closing cycle (when operating from the outside), the exterior handle can be rotated 360 degrees until the driving dog reengages the mating recess of the interior handle shaft. Engagement can only occur when the handles are in phase with each other due to the off set of the driver and mating recess from the door handle shaft centerline.

4. Seal

A bulb-type seal, (see Figure 1) energized by cabin pressure, is employed between the door and the door frame. Vent holes are provided in the inboard or pressure side of this seal. Cabin pressure passes through these holes and forces the crown of the seal against the seal striker around door opening.

The seal is constructed of tear-resistant silicone rubber, reinforced with Dacron fabric and contains an inner and outer pressure wall. Dual wall construction is a fail-safe feature to preclude loss of pressurization in the event of unforeseen damage to the outer pressure wall. The seal is also reinforced with a flexible spring steel wire, integrally molded within the seal, to eliminate the possibility of seal collapse. The internal spring wire supports the side walls of the seal against lateral pressure loads when pressurized, to assure positive alignment with the fuselage striker. The seal is vulcanized into a single one-piece unit to fit the extruded aluminum alloy seal retainer.

The seal retainer is screwfastened and riveted around the inside periphery of the door. The retainer consists of a formed section with two protruding lips along each side of its inner surface near the base. These lips fit over the molded flanges along each side of the seal and restrain the seal in position.

5. Drainage Provisions

A. Hinge Structural Box Drain.

There are two nylon drain tubes installed to the upper and lower structural hinge boxes for moisture drainage. One drain tube is installed between the upper and lower hinge boxes to drain moisture from the upper hinge box into the lower hinge box. Another drain tube is installed to the bottom of the lower hinge box to a drain outlet in the fuselage skin.

B. Door Pin Receptacle Drain (Lower Shear Pins).

A drain adapter cup is installed on the underside of each door pin receptacle to collect liquids and debris that may pass through the door pin hole. Clamped to the bottom of the cup is a flexible low pressure hose which in turn clamps to a drain outlet in the fuselage skin.

REAR SERVICE DOOR - TROUBLE SHOOTING

POSSIBLE CAUSE	ISOLATION PROCEDURE AND CORRECTION
1. DOOR DOES NOT OPERATE WITH HANDLE MOTION	
A. Sheared pin at attachment of door handle control link to fork on door interior handle shaft.	Replace pin.
B. Broken door operating cable.	Replace cable.
C. Interlock pin bushing partially out of door handle housing hub.	Remove door interlock mechanism access hole cover from inside surface of door trim panel or remove entire trim panel; refer to Chapter 25, EQUIPMENT/ FURNISHINGS. Push bushing into handle housing hub to free interlock mechnism. Incorporate bushing retainer clip on bushing at earliest opportunity; refer to 52-1-0 CABIN EXTERIOR DOORS Approved Repairs.
D. Cable midpoint ball out of slide tube control plate.	Replace cable midpoint ball in slide tube control plate, and safety wire.
2. DOOR HANDLE OPERATING LOADS EXCESSIVELY HIGH	
A. Operating cable tension too high.	Readjust cable tension; refer to door Adjustment/Test procedure.
B. Door binding in fuselage opening.	Accomplish door Adjustment/Test procedure.
C. Burrs on door tracks or daggers.	Remove burrs, refer to Structural Repair Manual for Door Track Allowable Damage Limits.
3. DOOR OPERATING MECHANISM WILL NOT LOCK OVERCENTER IN DOOR FULLY RAISED AND LOWERED POSITIONS	
A. Operating cable tension too low.	Readjust cable tension; refer to door Adjustment/Test procedure.
B. Broken counterbalance spring.	Replace counterbalance spring.

POSSIBLE CAUSE	ISOLATION PROCEDURE AND CORRECTION
4. HINGE FAIRING DOES NOT FAIR IN WITH FUSELAGE CONTOUR	
A. Nylon hinge fairing stop broken or out of adjustment.	Replace or adjust hinge stop; refer to door Adjustment/Test procedure.
B. Bent or broken hinge fairing link.	Replace hinge fairing link.
5. DOOR-OPEN WARNING LIGHT DOES NOT FUNCTION PROPERLY	
A. Circuit or light bulb malfunction.	Refer to DOOR-OPEN WARNING SYSTEM TROUBLE SHOOTING, Section 52-6-0.
6. INTERLOCK ACTUATING PIN, ON FORWARD EDGE OF DOOR IS NOT WITHDRAWING TO CLEAR HOOK RETAINER WHICH IS IMMEDIATELY ABOVE MICROSWITCH PLUNGER ON DOOR FORWARD JAMB, DOOR EITHER STOPS APPROXIMATELY TWO INCHES FROM CLOSING OR CANNOT BE OPENED WITH HANDLE MOTION.	
A. Interlock actuating pin mechanism out of adjustment.	Adjust interlock actuating mechanism; refer to Adjustment/Test.
7. DOOR EXCEEDINGLY HARD TO OPEN OR CLOSE, ESPECIALLY IN THE HALF-WAY OPEN OR HALF-WAY CLOSED POSITION	
A. Broken snubber-to-door attachment bolt.	Replace snubber-to-door attachment bolt.
B. Snubber out of adjustment.	Adjust snubber; refer to Adjustment/ Test procedure.
8. DOOR BINDS, CAUSING EXCESSIVE HANDLE LOAD; WILL NOT RAISE OR LOWER THE FULL AMOUNT OF TRAVEL	
A. Bent slide tube.	Replace slide tube.
9. FUSELAGE TRACKS AND DOOR TRACKS DO NOT PROPERLY MATE WHEN CLOSING DOOR	
A. Allowing door to free fall into closed position.	Manually assist door into closed position. Do not restrain door at inner handle, but on aft side of door inner surface.
10. DOOR JAMMED IN THE CLOSED POSITION	
A. Top edge of door skin damaged a and caught on edge of fuselage skin.	Insert a thin piece of sheet metal, approximately two feet long, between door skin and fuselage skin. Sheet metal to act as a sliding surface which will prevent skin interference when door rises. Open door; reshape door skin and fuselage skin to proper contour.

POSSIBLE CAUSE	ISOLATION PROCEDURE AND CORRECTION
11. EXTERIOR DOOR HANDLE LOOSE	
A. Large coil spring broken inside interior door handle assembly.	Replace large coil spring.
12. EXTERIOR DOOR HANDLE ROTATES BUT WILL NOT ENGAGE TO RAISE DOOR	
A. Large coil spring broken inside interior door handle assembly.	Replace large coil spring.
13. DOOR LOOSE IN OPEN POSITION	
A. Due to continuous operation of door, dimension of 0.005 to 0.020-inch between the slide tube control plate and titanium rub strips has become excessive	Add shims, as required, between the titanium rub strips and door structure to maintain the 0.005 to 0.020 -inch dimension between the slide tube control plate and titanium rub strips.

REAR SERVICE DOOR - REMOVAL/INSTALLATION

1. Removal/Installation Rear Service Door (see Figure 401)

A. Equipment Required - None.

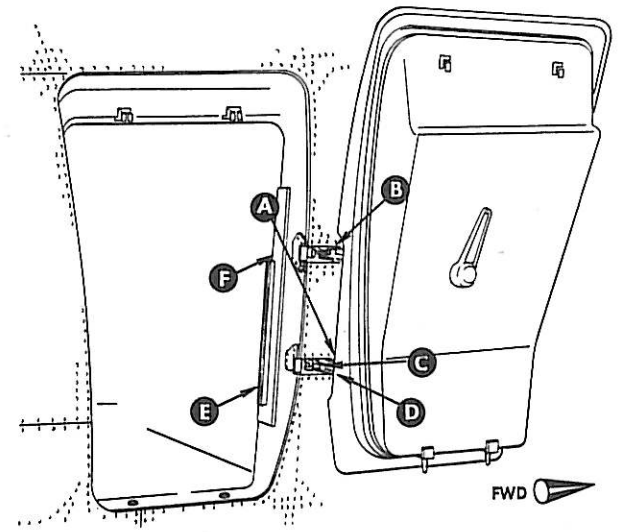
B. Remove Rear Service Door.

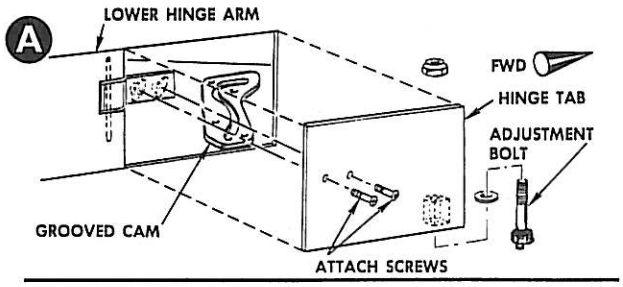
	Figure Detail
(1) Remove two screws securing the lower hinge arm tab fairing on the forward end of the lower door hinge arm.	A
(2) Remove tab fairing; disconnecting tab eccentric adjustment bolt from grooved track in lower fuselage hinge box.	
(3) Rotate door to open position.	
(4) Remove necessary trim and insulation to gain access to the hinge attach bolts. (Refer to Chapter 25, EQUIPMENT/FURNISHINGS.)	
(5) Remove nut, bolt, and bushing connecting rod end of door snubber to the upper door hinge arm.	B
(6) Remove nut, bolt, and bushing connecting hinge-stop linkage to the lower hinge arm of door.	C
(7) Remove nut, bolt, and bushing connecting the articulating hinge control link to the door control plate.	D
(8) Provide adequate support for door.	
(9) Remove nut from upper and lower hinge arm attach bolts at the fuselage hinge boxes.	E & F
(10) Remove the lower hinge arm attach bolt.	E
(11) Remove the upper hinge arm attach bolt.	F
(12) Slide hinge arms out of the fuselage hinge boxes; retain washers and bushings used at hinge connection to the fuselage.	
(13) Remove door from fuselage.	

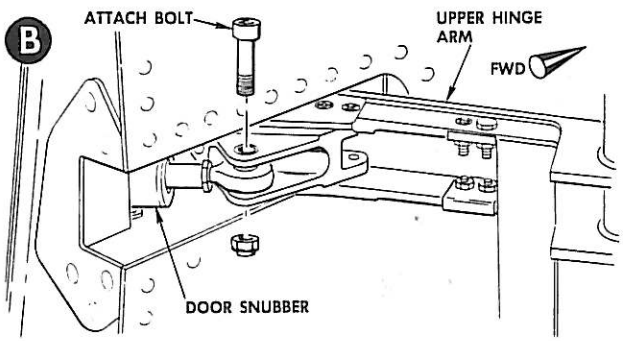
NOTE: Examine coating on door tracks. Repair (or replace) coating if it is worn sufficiently to expose bare metal. Refer to Chapter 51, STRUCTURES-GENERAL, for application procedure. By accomplishing this on door removal, time will be gained to allow coating to cure before reinstalling door.

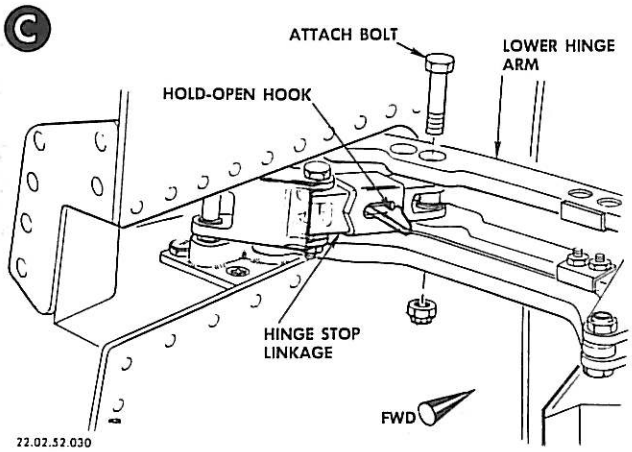
C. Install Rear Service Door.

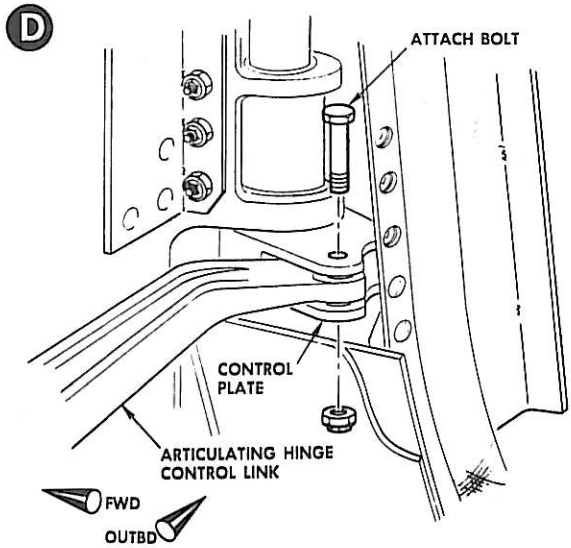
(1) Support rear service door so hinge arms align with fuselage hinge boxes.

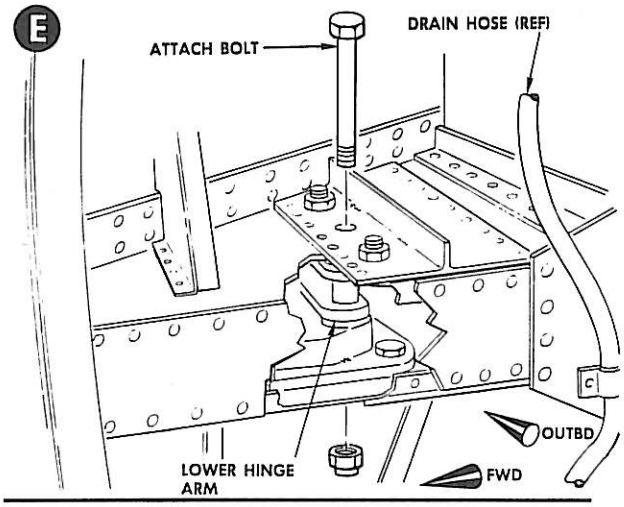

A
B
C
D
E
F
FWD

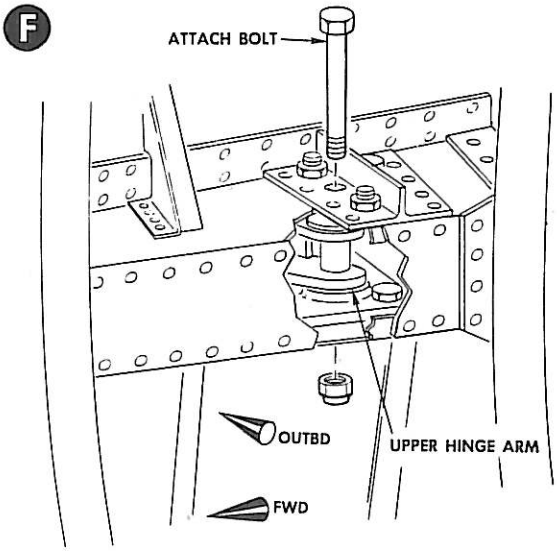

A
LOWER HINGE ARM
FWD
HINGE TAB
ADJUSTMENT BOLT
GROOVED CAM
ATTACH SCREWS


B
ATTACH BOLT
UPPER HINGE ARM
FWD
DOOR SNUBBER


C
ATTACH BOLT
LOWER HINGE ARM
HOLD-OPEN HOOK
HINGE STOP LINKAGE
FWD
22.02.52.030


D
ATTACH BOLT
CONTROL PLATE
ARTICULATING HINGE CONTROL LINK
FWD
OUTBD


E
ATTACH BOLT
DRAIN HOSE (REF)
OUTBD
LOWER HINGE ARM
FWD


F
ATTACH BOLT
OUTBD
UPPER HINGE ARM
FWD

C. Install Rear Service Door.

Figure Detail

(1) Support rear service door so hinge arms align with fuselage hinge boxes.

(2) Insert bushings in the door hinge pivot fittings of the upper and lower hinge arms. — E & F

(3) Align hinge with attach holes in the fuselage hinge boxes.

(4) Install a washer between hinge bushing and the fuselage hinge box, above and below each door hinge arm.

(5) Insert upper and lower hinge attach bolts through the fuselage hinge boxes, door hinge arms, bushings, and washers; install nuts.

(6) Insert bushing in the articulating hinge control link and align bushing with attach hole in the door control plate. — D

(7) Install bolt and nut connecting the articulating hinge control link to the door control plate.

(8) Insert bushing in door hinge-stop linkage and align with stop linkage attach hole in the lower door hinge arm. — C

(9) Install bolt and nut connecting stop linkage to the hinge arm.

(10) Insert bushing in rod end of door snubber and align with snubber attach hole in the upper door hinge arm. — B

(11) Install bolt and nut connecting snubber to the upper hinge arm of door.

NOTE: Postpone the lower hinge arm tab installation and adjustment until door adjustment/test procedure is accomplished. — A

(12) Accomplish rear service door adjustment/test procedure.

2. Removal/Installation Rear Service Door Hinge (see Figure 402)

Figure Detail

A. Equipment Required.

(1) Torque wrench calibrated in inch-pounds.

(2) Aliphatic naphtha, Federal Specification TT-N-95a.

(3) EC1293 sealer, 3M Co., St. Paul 6, Minn., or equivalent.

(4) Grease, Specification MIL-G-7421.

WARNING: ENSURE AGAINST DOOR HANDLE INADVERTENTLY BEING MOVED. IF HANDLE IS ALLOWED TO MOVE FREELY BY COUNTERBALANCE SPRING FORCE, THE MOVING HANDLE MAY CAUSE SERIOUS INJURY TO PERSONNEL.

B. Remove Rear Service Door Hinge.

NOTE: Bag and tag all loose hardware for ease of reinstallation.

(1) Remove door assembly from airplane. (Refer to Removal/Installation Rear Service Door.)

(2) Remove door interior control handle. (Refer to 52-1-0.)

(3) Remove door interior trim and necessary soundproofing. (Refer to Chapter 25, EQUIPMENT/FURNISHINGS.)

(4) Remove the slide tube and pulley bracket access doors on the forward interior surface of the door.

(5) Loosen nuts on cable hooks at the cable quadrant and disconnect cable ends. — A

(6) Remove nut and bolt securing slide tube to the upper slide tube bracket; remove slide tube plug. — B

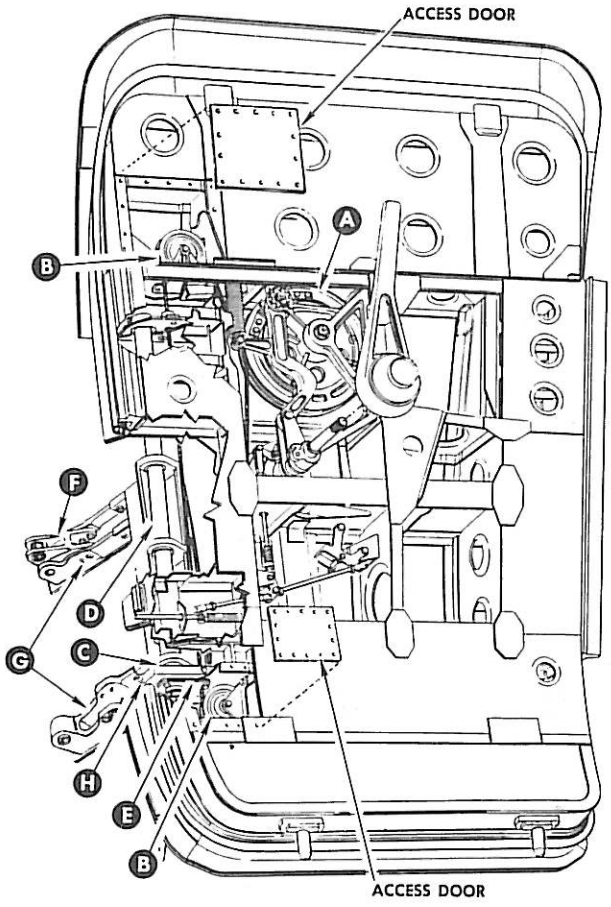
(7) At each slide tube bracket remove bolts, washers, and nuts securing brackets to the door structure.

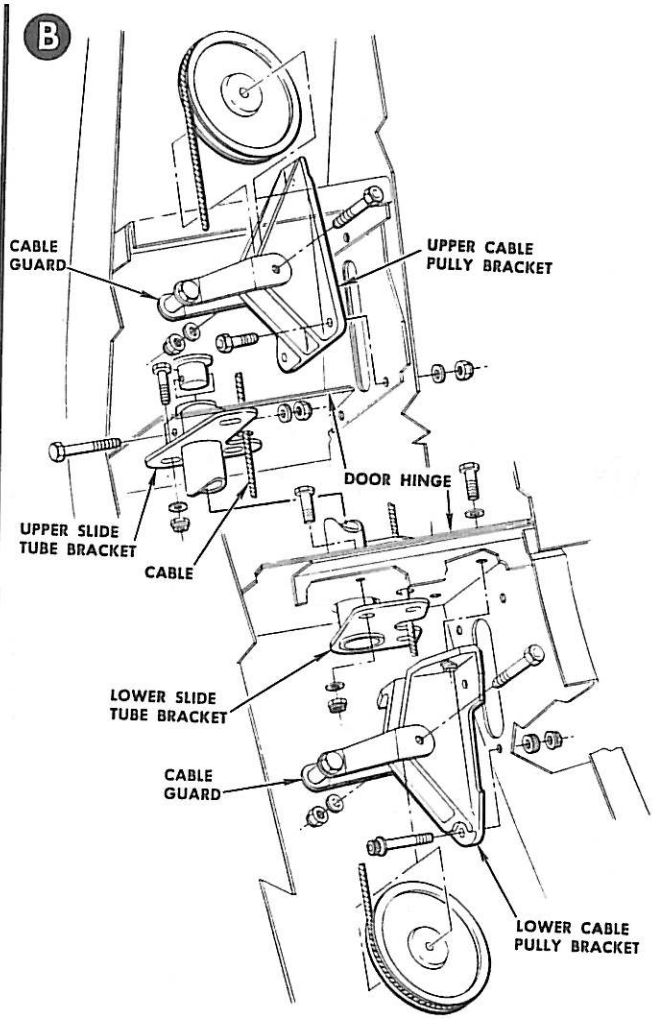
(8) Slide the slide tube brackets off each end of the slide tube.

(9) Remove cable midpoint ball retainers or safety wire from door control plate, remove cable midpoint ball from slot in door control plate.

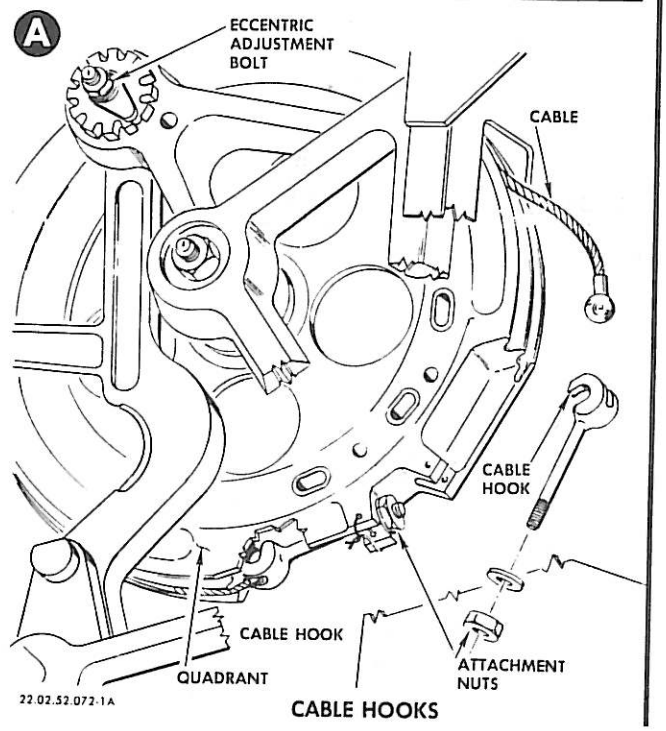
(10) Remove door hinge and slide tube from the door.

(11) Remove slide tube from the door hinge arm fittings.

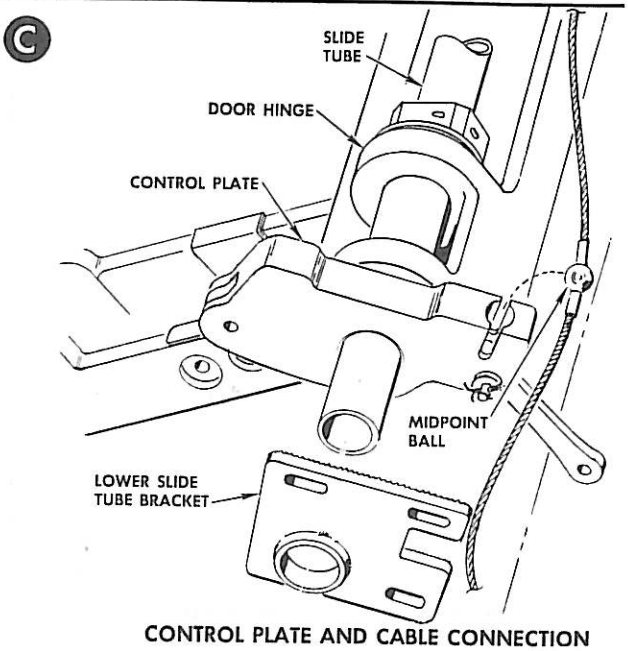




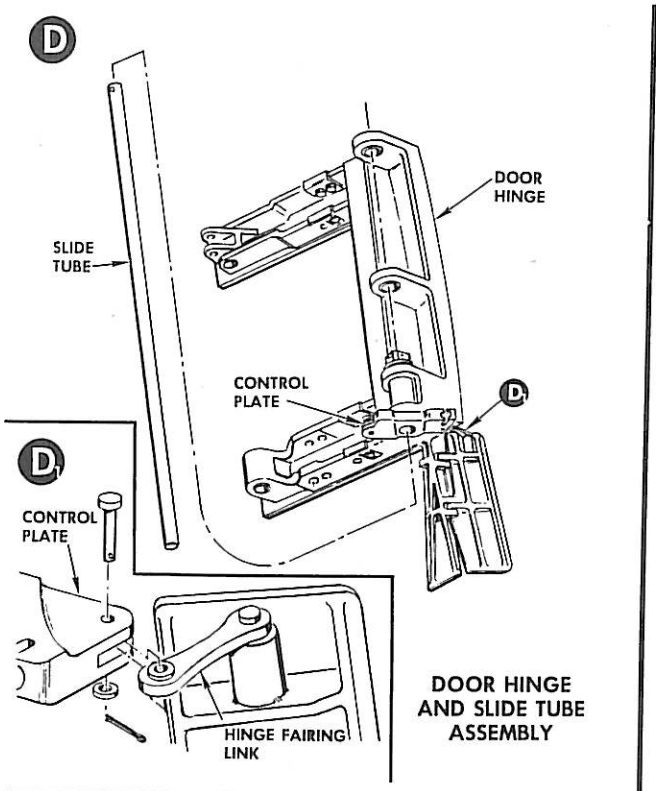
UPPER AND LOWER SLIDE TUBE BRACKETS



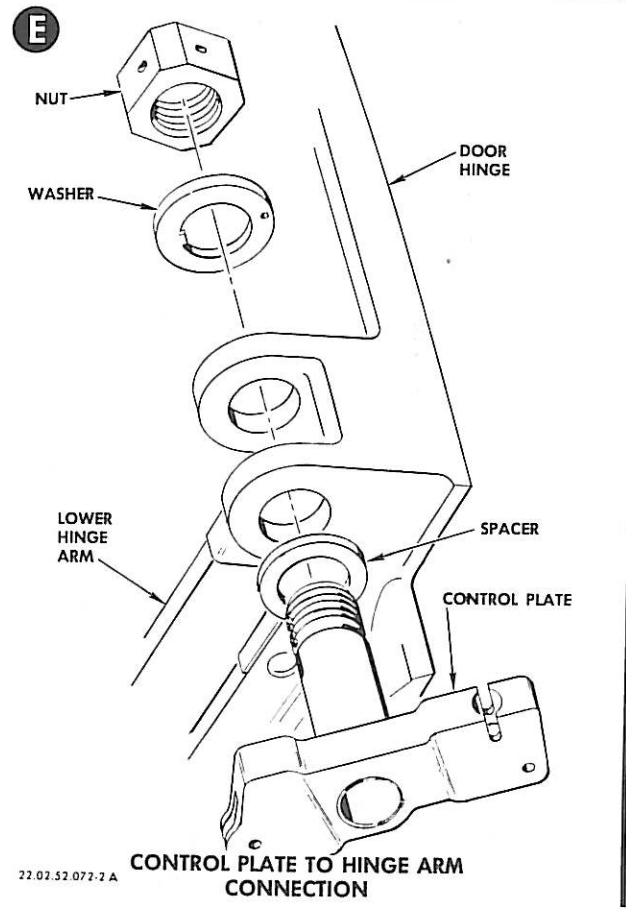
CABLE HOOKS



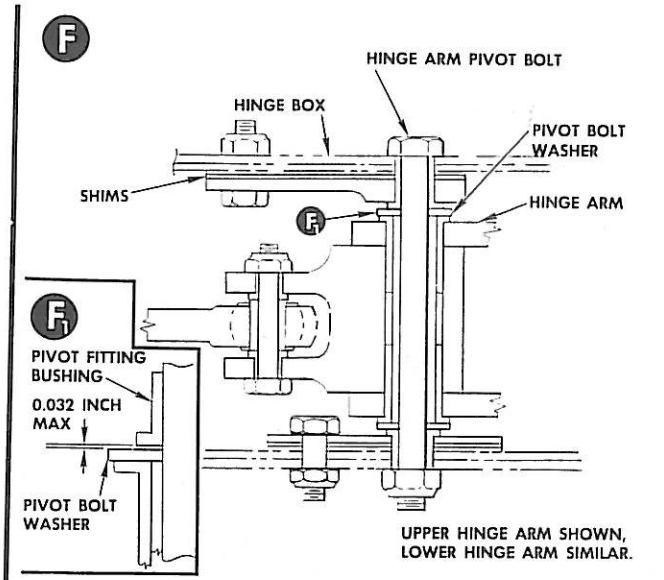
CONTROL PLATE AND CABLE CONNECTION



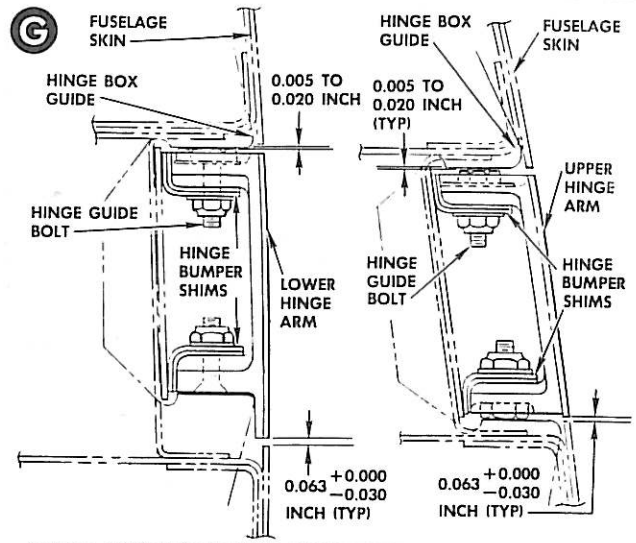
DOOR HINGE AND SLIDE TUBE ASSEMBLY



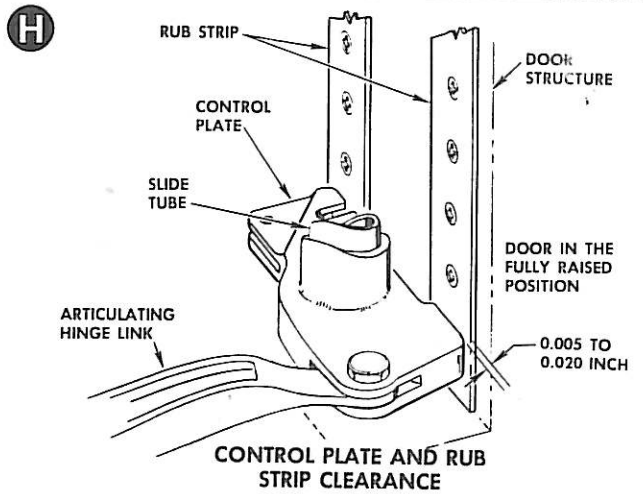
CONTROL PLATE TO HINGE ARM CONNECTION



TYPICAL HINGE ARM AND HINGE BOX CLEARANCE



HINGE GUIDE BOLT AND HINGE BOX GUIDE CLEARANCE



CONTROL PLATE AND RUB STRIP CLEARANCE

Figure
Detail

(12) Remove cotter pin, washer, and pin attaching hinge fairing link to the door control plate.

(13) Cut lockwire and remove nut, washer, and spacer securing door control plate to the door lower hinge arm; remove door control plate. E

C. Install Rear Service Door Hinge.

NOTE: Steps (1) through (4) apply only to installation of a new door hinge, or replacement of the hinge arm pivot fittings within the fuselage hinge boxes. These steps may be omitted if the original hinge and hinge arm pivot fittings are being reinstalled.

(1) With door removed from hinge, temporarily install door hinge in the fuselage hinge boxes. (Refer to Removal/ Installation Rear Service Door, steps C.(1) through C.(5).)

(2) Rotate door assembly to the open position.

(a) Measure clearance between the upper hinge arm pivot fitting and pivot bolt washer at each fuselage hinge box. Clearance shall be 0.032 inch maximum. F

(b) Add or remove shims between the hinge arm pivot fittings and the fuselage hinge boxes to obtain proper clearance.

(3) Rotate door hinge to the closed position.

(a) Add or remove washers under heads of the hinge guide bolts to obtain 0.005 to 0.020-inch clearance between bolthead and the fuselage hinge box guides. G

(b) If necessary trim the fuselage hinge box guides to obtain correct clearance.

(c) Remove or add hinge bumper shims as required to make hinge fair in with fuselage in the door-closed position.

NOTE: There shall be a minimum of one shim installed at each bumper location.

(d) Clearance between hinge arms and the fuselage skin shall be 0.063 (+0.000, -0.030) inch. Trim hinge as required.

	Figure Detail
(4) Remove door hinge from the fuselage hinge boxes.	
(5) Insert shank of door control plate through lower hinge arm fitting with threaded end towards the upper hinge arm.	E
(a) Install spacer, washer, and nut.	
(b) Torque nut 10 to 20 inch-pounds.	
(6) Install pin, washer, and cotter pin connecting hinge fairing link to the door control plate.	D
(7) Lubricate slide tube with specified grease. Insert slide tube through the hinge arm fittings, with bolt hole at the top.	
(8) Position door hinge and slide tube in door.	C
(9) Engage midpoint ball of operating cable in the door control plate slot and install cable midpoint ball retainers, if available, or safety wire.	
NOTE: Longest section of the cable, measured from the midpoint ball, routes through the upper cable pulley.	
(10) Install the slide tube bracket on each end of the slide tube.	B
(11) Using a clean cloth dampened with aliphatic naphtha, clean the slide tube plug and the inside surface of the upper end of the slide tube.	
(12) Apply sealer to slide tube plug and insert plug in upper end of the slide tube. Align bolt hole through plug, slide tube and bracket.	
(13) Install bolt and nut securing slide tube to the upper slide tube bracket.	B
NOTE: Steps (11) and (12) to be ommitted except for new slide tube installation.	
(14) Connect cable ends to cable quadrant. Lock wire cable hooks in hook slots of quadrant.	A
(15) Temporarily reinstall the door interior control handle. (Refer to 52-1-0.)	

Figure Detail

(16) With the door control handle in the open position, check clearance between the lower surface of the door control plate and top of the bolt retainers in the bottom of the slide tube well.

(a) Control plate shall clear bolt retainers. Adjust cable hooks to provide this clearance.

(b) Tighten cable hook nuts sufficiently to remove all slack in the operating cable.

(17) Check clearance between edge of the door control plate and rub strips inside of the slide tube well for full distance of travel. H

NOTE: The interlock mechanism actuating pin on the forward edge of door must be manually actuated in order to operate door mechanism.

(a) Clearance shall be 0.005 to 0.020 inch through full travel.

(b) Add or remove shims behind rub strips to obtain proper clearance.

(18) Install door assembly on airplane. (Refer to Removal/Installation Rear Service Door.)

3. Removal/Installation Door Pin Receptacle Drain Adapter Cup (see Figure 403)

A. Equipment Required - None.

B. Remove Door Pin Receptacle Drain Adapter Cup.

(1) Remove tread plate and carpet on floor panel inboard of door threshold; refer to Chapter 25, EQUIPMENT/FURNISHINGS.

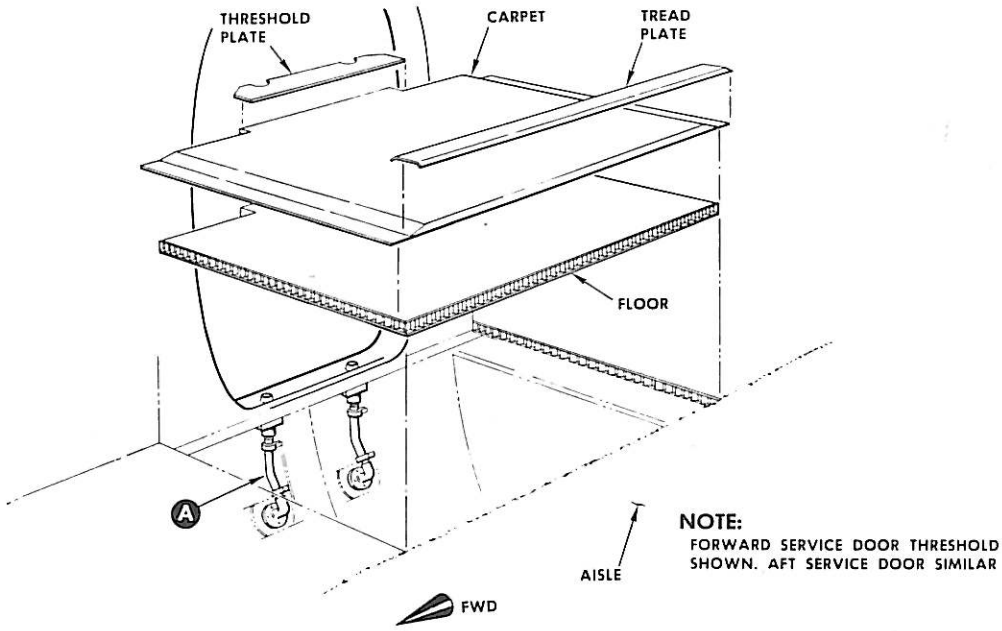
(2) Remove floor panel inboard of door threshold.

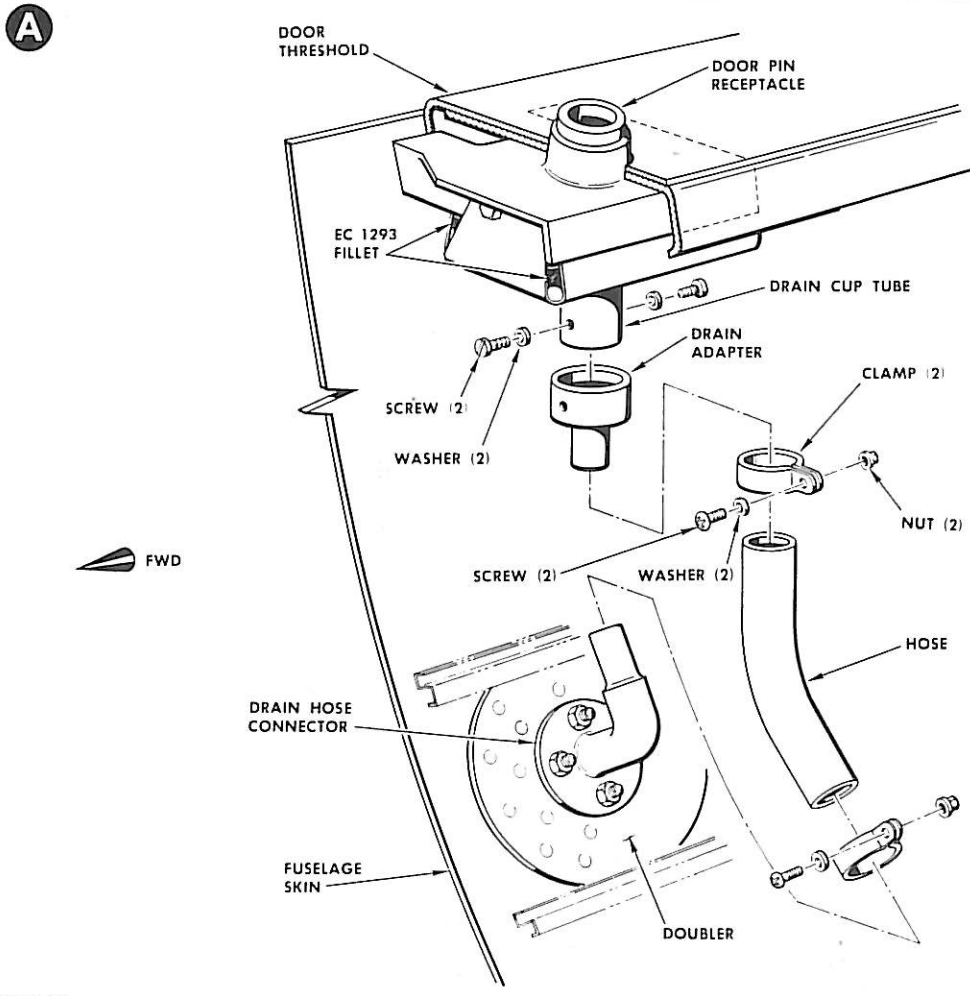
(3) Remove screw attaching hose clamp on bottom of cup, to stringer.

(4) Remove drain cup.

C. Install Door Pin Receptacle Drain Adapter Cup.

(1) Slide drain hose over lower end of drain cup, install clamp around hose and attach to stringer.





Service Door Pin Receptacle Drain Adapter Cup Installation
Figure 403

(2) Install floor panel inboard of door threshold, install carpet and tread plate; refer to Chapter 25, EQUIPMENT/FURNISHINGS.

REAR SERVICE DOOR - ADJUSTMENT/TEST

1. Adjustment/Test Rear Service Door (see Figure 501)

NOTE: All of the following steps apply after installation of a new door, new hinge, or reinstallation of a door where slide tube, pulley brackets, or door hinge have been removed or disturbed. On door adjustments where slide tube, pulley brackets, or door hinge have not been removed or disturbed, the steps marked by an asterisk * need not be accomplished.

A. Equipment Required:

(1) Calibrated cable tensiometer capable of measuring tension loads of 270 to 770 pounds.

(2) Spring scale or torque wrench with special adapter (Convair TSTO 22-57156, which fits over the inner handle hub).

(3) Wood block, two inch thick.

B. Adjust Rear Service Door.

CAUTION: WHEN CLOSING DOOR NEVER ALLOW DOOR TO FREE FALL INTO DOOR OPENING; DAMAGE TO DOOR HINGE MECHANISM MAY OCCUR. MANUALLY ASSIST DOOR INTO CLOSED POSITION. DO NOT RESTRAIN DOOR AT INNER HANDLE, BUT ON AFT SIDE OF DOOR INNER SURFACE.

(1) Slowly swing door outward and forward until the door hinge-stop linkage bottoms out.

NOTE: When the door hinge-stop linkage bottoms out the door hold-open hook should engage stop linkage.

	Figure Detail
(a) Move door aft until hinge is near midpoint of full travel. Loosen jam nut on snubber piston shaft and rotate shaft to lengthen, until retracted snubber piston is felt to bottom, while moving door gently about midpoint of travel. Shorten snubber piston shaft by rotating one full turn; retighten jam nut. Slowly rotate door to fully opened and fully closed positions to determine that snubber is not bottoming at extremes of travel.	A

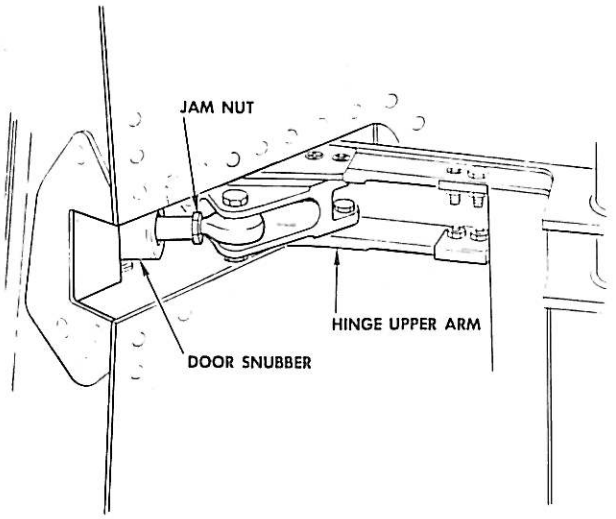
(2) Check the exterior door handle fair-in; refer to 52-1-0.

(3) Remove the interior door control handles; refer to 52-1-0.

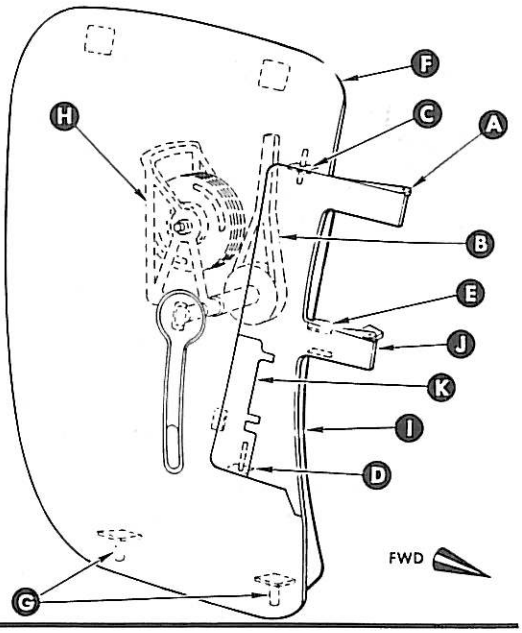
(4) Remove interior trim and necessary soundproofing as directed in Chapter 25, EQUIPMENT/FURNISHINGS.

(5) Temporarily reinstall interior door handle to accomplish door adjustments.

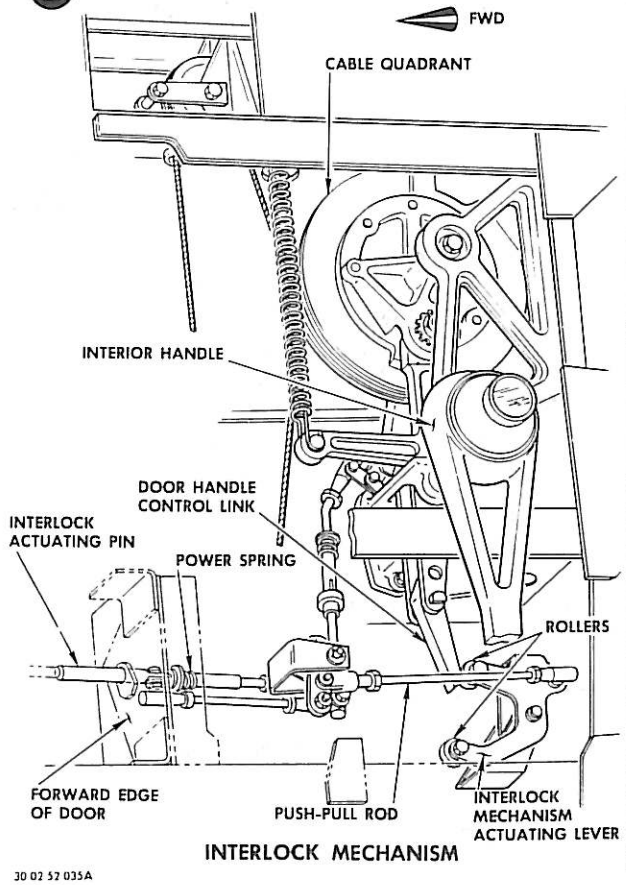
A



DOOR SNUBBER



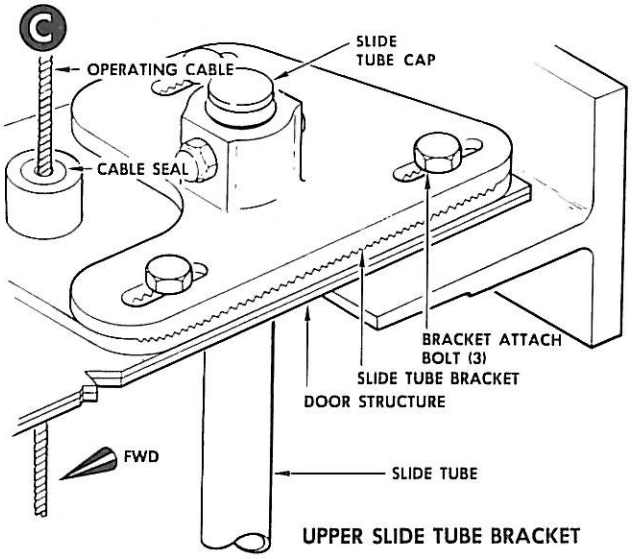
B



INTERLOCK MECHANISM

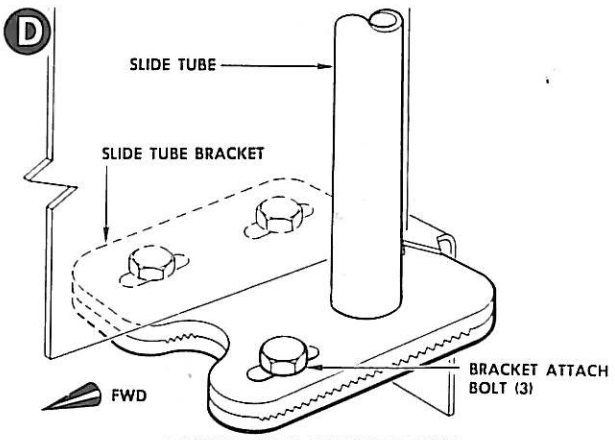
30 02 52 035A

C



UPPER SLIDE TUBE BRACKET

D



LOWER SLIDE TUBE BRACKET